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The South African Species of *Rhus L.*

By S. SCHONLAND.

(ILLUSTRATED.*)

A.—*Introduction with Brief Historical Notes.*

The South African species of *Rhus* are placed by Engler (in De Candolle, Monographiae Phanerogamarum IV, 1883) into his section *Gerontogeae*. The section is characterized by him as follows :—*Drupae globosae plerumque laeves, raro pilosae initio compressae, mesocarpio crasso paullum resinoso evittato cum endocarpio cohaerente, exocarpio demum soluto. Folia semper trifoliata, raro digitata, 5-foliolata.* The section seems to be an unusually natural one. Since the publication of the first volume of the Flora Capensis in 1859–60 no account of these plants which form such important constituents of our Flora has been readily available to South African students. Quite a number of new species have been described in Engler's work just cited and additional ones have been published from time to time by various authors. At the same time some species have been found to be untenable as material accumulated. With few exceptions the work done on the plants of this section has, by previous authors, been based on Herbarium material. This has frequently been too scrappy. Our species are normally dioecious and both sexes are required for descriptive purposes. In addition ripe fruits are required. Coppice shoots are frequently decidedly different from the shoots of adult plants. The branching and size of the inflorescence yield important characters, also the petiole and last, but not least, the leaflets. The flowers are distinguished only by minute characters which only rarely can be satisfactorily used in distinguishing the species. Unfortunately the vegetative organs are very variable, often on the same plant. To quote only a few examples: In *Rh. dentata* the dentation may vary on the same branch or may be absent altogether. Hairy and glabrous leaflets may be found on the same branch in this species. In a large group to which he refers 61 species, Engler divides these into species with winged petioles and those without wings, but these wings are often not developed, e.g. in *Rh. longispina*, where sometimes they reach their maximum development. Again, the shape of the leaflets may be quite protean, e.g. in *Rh. MacOwani* I picked from one bush leaflets which were ovate-acute, ovate-obtuse, obovate-obtuse, obovate-emarginate. They were mostly quite entire, but there were some with one crenation near the apex, others had 2, some 3, a few had more. Most of the leaves were 3-foliolate, but some were 5-foliolate.

From the descriptions of the species it will be seen that such instances are very common. This makes the construction of satisfactory keys to guide the beginner practically impossible. Only recently Prof. Engler, with reference to his key in " Die Pflanzenwelt Afrikas " mentioned to me that it must be used in conjunction with type specimens. Diels (in Engl. Jahrb. XXIV, 568) has had recourse to anatomical characters, but, as far as I can judge, these are only of subsidiary value. In any case they would have to be investigated on a much bigger scale than this has been done hitherto, to be of much value in determining species.

In view of the extreme variability of the S.A. species of *Rhus* I have for a number of years given special attention to them in the field. In the year 1924 I had the advantage

* All figures are natural size, unless otherwise stated. The tertiary veins are in most cases drawn in a portion of one leaflet. Hairs are omitted in the majority of drawings.

of inspecting the collections of *Rhus* at Kew and Dahlem-Berlin. Aided by a grant from the Union Research Grant Board, I was enabled to examine these again more carefully in 1927, and I also studied the collections in the Linnean Herbarium and at the British Museum, London. I also had the privilege of examining Thunberg's Herbarium* preserved at Upsala and Jacquin's specimens preserved at Vienna. In addition, I have seen most of the material preserved in S. African herbaria. The herbarium of the S. African Museum was particularly helpful as it contains most of Ecklon and Zeyher's types. Many friends have supplied me with abundant material, and a number of foresters in the Union Department of Forestry have, by instruction of the Chief Conservator of Forests, contributed much live material and many notes. If in spite of all this help, for which I express my very best thanks, my work does not come up to expectations, I can only plead that the nature of the task made a quite satisfactory solution practically impossible, and I can assure all my friends, to whom I owe so much in this connection, that at all events all the material has had earnest attention and consideration.

The drawings in this paper have mostly been executed by Miss Olive Armstrong, by kind permission of Mr. J. Hewitt, Director of the Albany Museum. Much assistance was received from Mr. R. A. Dyer, M.Sc. of the Botanical Survey, and by his permission, Miss G. Britten typed this paper.

There have been six more or less extensive accounts of South African species of *Rhus* published, in which they have been either carefully described or their descriptions have been short, but type specimens are mostly in existence. I refer to (1) Willdenow, Species Plantarum I (1797), which represents the 4th edition of Linnaeus' Species Plantarum ; (2) Thunberg, Flora Capensis ed. Schultes (1823) ; (3) De Candolle, Prodromus II (1825) ; (4) Ecklon and Zeyher, Enumeratio Plantarum Afr. Austr. Extratropicae (1835–37) ; (5) Sonder, in Harvey and Sonder, Flora Capensis I, 504 (1859, 1860) ; and (6) Engler, in De Candolle, Monographiae Phanerogamarum IV (1883).

A few remarks on some of these may not be out of place. Thunberg, who described 29 species, mistook *Rh. laevigata* L. His mistake has been perpetuated until now, and I have been compelled to give it a new name, *Rh. Legati*. His *Rh. spicatum* is *Schmidelia decipiens*, which frequently is even now mistaken for a species of *Rhus*† [it was, e.g. described by Schinz as *Rh. knysniaca* in Vierteljahrschr. d. naturf. Ges. Zürich LX (1910) 238]. *Rh. cirrhiflorum*, *dimidiatum*, *tridentatum*, and *Rh. digitatum* are species of *Rhoicissus*. *Rh. pauciflorum*, *Rh. alatum*, and possibly *Rh. obliquum* are *Hippobromus alata* E. et Z. *Rh. sinuatum* Thunb. is unknown from South Africa, but agrees exceedingly well with an Indian species (*Rh. mysurensis* Heyne).—Ecklon and Zeyher enumerate 48 species of S.A. *Rhus*. An attempt is made by them to arrange them in natural groups, but this must be looked upon as a total failure. They erroneously ascribe hermaphrodite flowers to most of them. The number of species has been unduly increased by them and older names have frequently been erroneously used. Their No. 1110, *Rh. Plukenetiana* E. et Z., which does not appear to have been mentioned by subsequent authors, is *Rh. tomentosa* L. Their reference to one of Plukenet's figures is wrong. This figure represents *Rh. incanum* Mill., as shown by Plukenet's original in the British Museum.

Sonder with his usual minute care and taxonomic insight did a great deal to clear up the synonymy of the species known to him and arranged them in accordance with an artificial key which he constructed. He recognized 53 species. Of the new species described by him I have had to rename his *Rh. tridentata* and have called it *Rh. Fraseri*. His numbers 47 to 52, *Rh. Thunbergii Hook.* (=*Rh. argyrophylla* Presl), *Rh. dispar* Presl, *Rh. concolor*

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* See Schonland : The genera *Rhus* and *Crassula* in Thunberg's Herbarium, Arkiv för Botanik XXI. A (1927), No. 16.

† E. Meyer, in Drège exsicc. places it also under *Rhus* and has given it three different names. He also refers to our genus all other South African species of *Schmidelia* ; further he does the same with *Myaris inaequalis* Presl, *Xanthoxylon capense* Harv., and *Sapindus oblongifolius* Sond. as a reference to Vol. I of Harvey and Sonder. Fl. Cap.. will show.

Presl, *Rh. mucronifolia* Sond. (=*Rh. salicifolia* Presl), *Rh. salicina* Sond., *Rh. paniculosa* Sond., were later removed by Engler to the genus *Heeria* Meisn (=*Anaphrenium* E. Mey.) and No. 53, *Rh. longifolia* Sond., to the genus *Protorhus* Engl.

Engler accepted almost all species recognized by Sonder. It goes without saying that this was done after due consideration and, if there was any evidence required, it shows itself in the much more detailed descriptions drawn up by Engler as compared with Sonder. He must have overlooked *Rh. magalismontana* Sond. (a type of which is, e.g. in the Herbarium of the S.A. Museum). He doubtfully referred *Rh. sinuata* Thunb., which Sonder had seen in the Thunberg Herbarium, to *Rh. refracta* E. and Z., and he raised *Rh. dentata* Thunb. var. *puberula* Sond. to specific rank as *Rh. Sonderi* Engl. However, the general agreement is a striking testimony to Sonder's discriminating and painstaking work, but it further proves that our species of *Rhus*, in spite of their enormous range of variability, are on the whole entities recognizable by the trained botanist. Engler in his monograph described some additional varieties of some species and also 14 new species not included in the Flora Capensis. About 20 additional species have been published since the appearance of Engler's monograph. I have seen types and descriptions of all of these with the exception of *Rh. dunensis* Gandoger in Bull. Soc. Bot. de France LX (1913), 119, and *Rh. tumulicola* S. Moore in Journ. of Bot. 1921, LIX, 227. The latter judging from the description appears to be *Rh. Zeyheri*.

Diels, in his essay entitled "Die Epharmose der Vegetationsorgane bei *Rhus* L. § *Gerontogeae* Engl." (in Engl. Bot. Jahrb. XXIV, 568), made an attempt to divide this section into natural groups in which the *Villosa* group formed the centre of nine others. He made, as mentioned before, extensive anatomical investigations, but in the delimitation and treatment of the groups in detail he makes very little use of them except, that he lays very great stress on the absence and, if present, on the nature of the indument which is composed of ordinary and glandular hairs in variable proportions. He also emphasizes the various methods of reduction in leaf-surface. While his results are undoubtedly an advance on our previous knowledge, it will be seen later that I do not agree with them altogether. Diels stated that, with the increase of material, the delimitation of the species, which seemed on the whole to be comparatively easy at the time when Engler wrote his monograph, has become more and more difficult, and he pointed out that some previously described species could not be kept up.

B.—*Distribution.*

Most S.A. species are found on the seaward side of the great escarpment (as defined by Rogers in Botanical Survey Memoir No. 4, 1922, p. 10) with only a few in karroid portions. Many are found in the Transvaal. Some are found in the Basuto highlands, the Orange Free State, and other inland portions of South Africa, but even in parts with comparatively good rainfall which the majority inhabit, there are some which prefer stony dry hillsides. In fact a very intimate knowledge of local conditions is required to judge the relations of climate and structure in this genus. In the arid parts of South Africa some species, such as *Rh. lancea* and *Rh. viminalis* are well known to occur only in such places where their roots can reach ground water, and it is, therefore, not astonishing to find that Cannon found the highest rate of transpiration of Karroo plants in *Rh. viminalis* along stream beds at Matjesfontein. Its leaves are very little protected by a resinous secretion and have no fixed relation to the light (Cannon, W. A., General and physiological features of the vegetation of the more arid portions of Southern Africa, with notes on climatic environment, Washington, 1924, p. 145). On the other hand, there are others which grow in sand-dunes by the sea exposed to physiological drought, e.g. *Rh. Schlechteri*, *Rh. crenata* Thunb., forms of *Rh. mucronata*, etc.

C.—*Habit.*

The majority of South African species of *Rhus* are much branched shrubs from 8 to 10 feet high. A fair number of these may assume an arborescent habit reaching heights of 20 to 30 feet, but only one, *Rh. Legati* (*Rh. laevigata* Thunb. non Linn.), may become a

conspicuous tree with a well-defined trunk reaching a height of 60 to 80 feet. Some, e.g. *Rh. lancea* and *Rh. viminalis*, assume a willow-like habit. A few, e.g. *Rh. rosmarinifolia*, *Rh. discolor*, *Rh. gracillima*, *Rh. Wilmsii*, *Rh. Keetii*, are dwarf shrubs, unbranched or very little branched above ground. The first of these has assumed a somewhat heath-like habit with its narrow leaflets recurved at the margin. The last four occur in grassveld and in the last two especially an approach to a grass-like habit can be discerned.

Some species are always thorny, e.g. *Rh. longispina* E. et Z. A number of others are often thorny, e.g. *Rh. pyroides*. One often finds also dwarfshoots forming a transition between ordinary shoots and thorns. In some species thorns are only found in seedlings and coppice-shoots, e.g. regularly in *Rh. Legati*. The vegetative organs vary considerably in many species. Many species form coppice shoots readily and these shoots at first are often very different from ordinary shoots. The variations in the ordinary shoots are usually shown especially in the leaves, which will be referred to presently.

D.—*The Leaves.*

The majority of species have well-developed petioles, which are often subsemiterete, canaliculate above. They are often slightly edged, and when this is readily discernible they are described as winged.

Usually the leaves are trifoliolate. Leaves with five leaflets are the rule in *Rh. montana* Diels (as far as the scanty material shows), and are occasionally found in *Rh. MacOwani* Schonl. Less than three leaflets are also occasionally met with.

In some species, e.g. *Rh. tomentosa* and *Rh. Legati*, the leaflets have petiolules, but usually the leaflets are sessile. Ovate and obovate outlines, with a cuneate base, predominate, but narrowly linear and lanceolate shapes are found in a few species which, as Diels rightly remarks (l.c. 594), are the final products of certain tendencies of evolution. Unfortunately the leaflets yield the most important, though not the only characters, on which the delimitation of species in this genus can be based, and it must be very annoying to anybody who wants to study the genus to find a great vagueness in the descriptions of even their shape. The consistency of the leaflets is more constant, but cannot always be clearly seen in dried specimens. In one case, *Rh. carnosula* Schonl., the leaflets are slightly fleshy, though when dried they appear coriaceous. The margin of the leaflets is often more or less characteristic, but teeth (not always of the same shape) may be found in species which have usually an entire margin and, not only in different individuals but even on the same branch, differences in shape and margin of the leaflets may be found in many species.

The enormous plasticity in the shape of the leaflets may be due to *Automorphosis* dependent on internal causes which we cannot trace, or, in other words, to variations in the Darwinian sense. However, in some cases they are clearly due to hybridisation,* though in many others hybridisation may be safely ruled out of court.

The nervation of the leaflets is fairly characteristic for the different species, and has been indicated on most of the illustrations of leaves which accompany this paper. I have distinguished in the descriptions between (*a*) midrib, (*b*) lateral veins which are often slightly branched, and (*c*) tertiary veins, the finer ultimate ramifications. The last are often not visible with the unaided eye or with the aid of a lens. They may even be absent altogether. The reticulation may be coarse as in *Rh. mucronata* and *Rh. nebulosa* Schonl., or it may be fine-meshed, but there are gradations which cannot always be expressed in the descriptions. The trichomes found on the leaflets (as well as on the petioles, branchlets, and inflorescence) are to a certain extent of taxonomic value, but in certain cases, e.g. in *Rh. mucronata* they must be ignored as a means of specific distinction. Already Diels stated (l.c. 605) this somewhat as follows:—The covering of trichomes cannot be traced to exogenous conditions. There is no way to judge which circumstances can effect the quality of the indument. "We can only observe that within closely related species the combination of ordinary hairs and glandular hairs varies enormously quantitatively. Espe-

* For supposed hybrids see pages 9, 23, 29, 37, 41, 42, 43, 47, 54, 58, 66, 75, 108, 112.

cially is this the case in *Rhus* § *Villosa*. Sometimes we see hairs and glands approximately equally represented. Sometimes hairs preponderate especially in the more xerophilous forms, which inhabit the eastern interior." (I cannot follow his reasons in the next remarks, which seem, on the one hand, to indicate a relation of the hairy covering to the rainfall, but, on the other hand, contradict it.) Very hairy, subglabrous and glabrous forms of *Rhus mucronata* are found almost side by side on Table Mountain. The most villous form known to me from South Africa is *Rh. Ernesti* Schonl. found at Barberton. Numbers of species have very hairy young leaves, etc., but become more or less glabrous when adult. Diels continues :—" In contrast to the hairs the glands (of which he illustrates some on Taf. XIV) have a firmer existence. In thousands of specimens where the former are in the process of dying or have disappeared altogether, the glandular trichomes remain in undiminished number. Even if the lamina decreases in size, they become more numerous per unit of area and there result races with chiefly glandular covering. Which are the conditions that favour such a development is impossible to me to even conjecture." Predominance of glands is especially pronounced in the *Lucida* group. That in some cases it is associated with habitat in which the plants are subjected to physiological drought, as in sand dunes or to arid conditions in the interior, seems to be evident. The glands frequently secrete a resinous substance, which when dry and thin layered makes the leaflets look " varnished " or when thick it may become grey or powdery, but this again can only very cautiously be used for specific discrimination. Thus, Marloth says in " Das Kapland " (1908), 324, with reference to *Rh. mucronata* and *Rh. lucida*, " on the leaves resin is rarely seen near Capetown, but constantly in the Little Karroo and other dry parts. On the other hand, *Rh. glauca* is richly provided with resin, even in the extreme South-West. The young leaves are covered with a soft, sticky varnish which dries in summer and forms a white crust. Several other species of *Rhus* (as well as a *Psoralea* and *Conyza ivaefolia*) protect themselves in the same manner."

E.—*Inflorescences.*

The inflorescences are panicles, sometimes poorly branched, in which case they are lax as, e.g. in *Rh. mucronata* and *Rh. pyroides* Burch. (non auct. al.). In other cases they are richly branched and bear an abundance of flowers as, e.g. in *Rh. MacOwani* and *Rh. Legati*. They may be axillary, usually in the axils of the upper leaves, or terminal. Usually both axillary and terminal occur in the same species. These and similar characters are often of great assistance in distinguishing allied species, but should be employed cautiously as sometimes male and female differ in these points. The pedicels are usually about 1 mm. long, though somewhat longer ones occur and sometimes they are shorter, the flowers then forming glomerules. The floral bracts are short and usually narrowly lanceolate.

F.—*Flowers.*

The flowers are typically unisexual, the plants dioecious. Truly bisexual flowers occur, but only as exceptions in usually unisexual species. Ecklon and Zeyher's statements to the contrary are not based on facts. The flowers are usually pentamerous, but variations in the number of floral parts occur occasionally. The calyx has in the usual pentamerous flowers 5 segments, which in some species are not equal. There are 5 petals, usually oblong-ovate and greenish-yellow or whitish. Then follows a disk which is usually 5-crenate. Very often it is slightly crisped, giving the appearance of 10 crenations, but sometimes the disk is actually 10-crenate. In male flowers there are 5 stamens and often not a trace of a gynaecium. On the other hand, the female flowers exhibit usually 5 staminodes. The gynaecium has a more or less globose ovary with 3 short, separate, filamentous styles.

On the whole, there is such a want of differentiation in the structure of the flowers that it is difficult to utilize their characters for taxonomic purposes. Even the size, though always small, varies in the same species, yet when used with discretion, size can sometimes be used as an aid in discriminating some allied species. Generally the length of the petals is $1\frac{1}{4}$ to $1\frac{1}{2}$ mm., as e.g. in *Rh. MacOwani* Schonl. ; sometimes it reaches 2 mm. as, e.g. in *Rh. mucronata* Thunb.

G.—*The Fruit.*

The fruit is a drupe with fleshy mesocarp, which, however, in some species dries up more or less when the drupes ripen, while in others it remains juicy for a long time. In *Rh. incisa* var. *obovata* the old drupes split open exposing the pyrena and we thus find here a transition to a capsular fruit. The pyrena is usually distinctly compressed even in globose fruits. The colour of the drupes is often greenish, sometimes red (as in *Rh. Legati* and *Rh. dentata*), sometimes brown. The shape is often globose or subglobose, in some species it becomes occasionally or in others always asymmetrical. Usually the drupes are quite smooth and glabrous. In the *Tomentosa* and *Populifolia* groups hairy drupes are found, in the latter also verrucose drupes. In the *Populifolia* group tricuspidate drupes occur, through the retention, hardening, and slight thickening of the styles. This is also occasionally found in other groups.

H.—*Uses.*

Some species as, e.g. *Rh. crenata* help greatly in fixing coastal sanddunes, but I am not aware that this property has been used by planting these species. Many species favour streambanks, e.g. *Rh. mucronata, Rh. MacOwani, Rh. dentata*, and in the dry parts of South Africa, *Rh. lancea, Rh. viminalis*, and other members of the *Lancea* group. They thus prevent useful soil being swept away. On the other hand, a great deal of damage has been done, where wood is scarce, by the wholesale destruction of these species for firewood and other purposes. It is very desirable that extensive experiments should be made to see whether they can be restored.

The bark of some species is used for rough cordage, hence the name Taaibosch.

The wood of most species is tough (frequently of a reddish colour), and various species, e.g. *Rh. mucronata, Rh. lucida, Rh. pyroides*, and even *Rh. Engleri*, are used for making kerries and pickhandles. Whipsticks are made of *Rh. mucronata*. A systematic examination of these woods is not available. They are usually passed by, because their trunks rarely reach proper timber-size, and they are often found where better timber-trees are available. Even *Rh. Legati* (*Rh. laevigata* Thunb. non Linn.), which grows into a large tree is not favoured by sawyers, though its wood is often used for wagon work. According to Pappe, in "Sylva Capensis" (1869), the thicker and longer branches of *Rh. viminalis* (Karee wood) are used as spars in thatching houses and also for wagon tents, as they bend easily without breaking; the younger twigs for bows.

In former years the bark of *Rh. lucida* (Taaibosch or Cape Sumach) and *Rh. tomentosa* was used for tanning purposes. Various species are locally used as hedge-plants; I would especially recommend *Rh. erosa*, which has a very striking appearance and should clip well. Goats and Persian sheep have been noticed by me to eat the foliage of *Rh. undulata* and *Rh. longispina*, and others are also reported to be eaten by stock, but as pasture plants they will never be of much consequence except as a last resort in the most arid portions of South Africa. Various species are reported to have edible drupes, but to appreciate this statement one must know what other astringent fruits South African children will eat and apparently enjoy. There is no hope that any of our species will yield a fruit that will be generally acceptable.

I.—*The Phylogeny of South African Species of Rhus.*

D. H. Scott [in Progressus Rei Botanicae (1907), 139] rightly stated that the determination of the actual course of descent is the ultimate or chief object of the scientific systematist.

The course of evolution in South African species of *Rhus* may be here and there traced or, more accurately speaking, surmised, but its cause and its mechanism are for the present quite hidden from us. At first sight the cause in many cases seems to be laid bare by the fact that forms, such as we find, e.g. in the *Tomentosa* group, which deviate much from the supposed original type, have many characters which have enabled them to adapt themselves to a drier climate or to greater extremes of climate than the typical forms. They have become more xerophytic, and it is evident that much of the development of South African species of *Rhus*, as in so many other South African plants, has taken place in the direction from more mesophytic types to more and more xerophytic types of the vegetative organs

by reduction in the breadth of the leaflets, thickening of the cuticle, exudation of resinous substances, recurving of the lamina in narrow leaflets, sunk stomata, etc. However, it is quite plain that these and similar characters, which enable some species to exist in some of the most arid parts, are not directly caused by the climate. This statement cannot be proved accurately, though it is significant that, e.g. the densely villous *Rh. mucronata* var. *villosa* and *Rh. Ernesti* occur in parts with a considerable amount of rainfall. We find one character, especially though not exclusively, developed in the *Populifolia* group, which is only found in species of dry localities. I refer to the retention of the styles and their slight thickening in these species. This is an evolutionary tendency for which no reason can at present be assigned. Another evolutionary tendency, a hairy covering of the fruit has found its clearest expression in the *Tomentosa* group, which, however, are found in localities where other species with glabrous drupes are found.

How difficult it is to correlate the conditions under which species with diverse characters grow may be illustrated by the following example : Near my home, Aylesby, near Grahamstown, there are growing wild, under apparently identical conditions, *Rh. MacOwani*, *Rh. undulata*, *Rh. lucida*, *Rh. longispina*, *Rh. incisa* var. *obovata*. Half a mile away *Rh. tomentosa* is found under apparently the same conditions.

The clearest indication that characters which are most useful in dry localities are not necessarily caused by arid conditions is given by the thorny species, for the most formidable thorns are found in seedlings and coppice shoots of *Rh. Legati*, a species which is never found in arid parts or dry localities. To quote another instance :—*Rh. longispina* and *Rh. undulata* are often growing side by side, the former armed, the latter unarmed. Both are browsed upon like many other species of *Rhus* by goats and other herbivorous animals.

The extreme innate variability of the leaves of many South African species of *Rhus* has already been referred to. In some of these cases at all events, hybridization seems to be clearly excluded, in many others it is not likely to be the cause of variation, yet there can be no doubt that some species, e.g. *Rh. dentata* hybridize freely.

Only one with an experienced eye can recognize the hybrids, or rather he can *guess* that he is dealing with hybrids, because proof could only be furnished by very lengthy cultural and cytological investigations.

Diels has assumed that his *Villosa* group has formed the starting point for all other African groups of the genus. He has made out a strong case for this assumption and we have accepted it. His *Villosa* group corresponds largely to the *Mucronata* group of the present paper. Diels imagines that the *Rhus* § *Gerontogeae*, which are found in the whole of Africa, parts of Makaronesia, South Arabia, Syria, British East Indies and territories adjoining in the North East, Socotra and the Comore Isl., but not in Madagascar, have entered Africa in the North. He draws an interesting parallel of their origin and migrations with that of the Antelopes. The *Mucronata* group covers almost the whole of the distribution of the section, but already the *Natalensis* group, which it is assumed has been derived from it, has almost as wide a distribution, though in South Africa it does not go beyond districts which have a subtropical climate. There are an enormous number of forms in Tropical Africa which have been (to my mind wrongly) referred to *Rhus villosa* L.f., while other distinct tropical species also belong to Diels' *Villosa* group. *Rh. natalensis* Bernh. (*Rh. glaucescens* Rich.) is also much differentiated in Tropical Africa, but the material of *Rhus* hitherto collected in Tropical Africa, though very large is mostly defective and usually not accompanied by sufficient notes. It cannot be too often pointed out that scraps taken from a tree or shrub with nothing but the locality are practically useless for taxonomic purposes or at all events give more trouble than they are worth, besides often creating confusion. Starting from the *Mucronata* and *Natalensis* groups further differentiation took place already in Tropical Africa while the genus spread southwards, but the largest differentiation clearly took place after it reached South Africa.

I have arranged the South African species into twelve groups. Of these, in addition to the *Mucronata* and *Natalensis* groups, the *Lancea* and *Discolor* groups extend a good deal

into Tropical Africa ; some others also are not strictly confined to Temperate South Africa, though their origin may be looked for at all events considerably south of the equator.

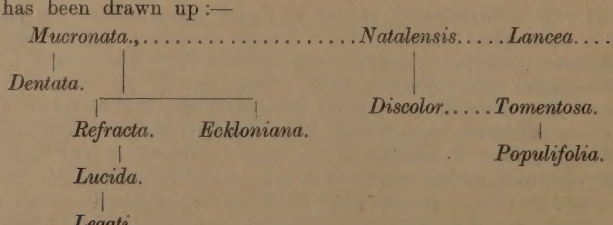
The *Discolor*, *Tomentosa*, *Populifolia*, and *Horrida* groups are more removed from the original type than the others, and may be the youngest groups. In all of them a xerophytic tendency is clearly discernible, especially in the three last ones. The *Discolor* group shows relations to the *Tomentosa* and *Populifolia* groups, while the *Horrida* group may have been derived from the *Lancea* group. While these general relations can be observed, I fail to see how a more detailed evolutionary scheme can be presented from available data.

Diels (l.c. 644) says :—" The gerontogaeous species of *Rhus* furnish as it were a type, which in the generative sphere has been stabilized since immemorial times, but whose life-energy is represented by the elasticity of its vegetative organs in response to external influences. Therefore, according to him, one succeeds here in picturing much more easily the conditions for one kind of polymorphism, the epharmonic one, than is possible in the majority of objects, where the greater complexity of all circumstances forces itself at once on the observer. Thus, the *Rhus* § *Gerontogeae* furnish an interesting instance, how in many cases epharmosis, here equivalent with what is usually known as formation of species, has been brought about."

Now, in the first place, the epharmosis of the vegetative organs of our species of *Rhus* is not the only, though the most important point in their differentation. Further, the detailed account of the epharmosis of the vegetative organs, while often most interesting, and here and there no doubt rightly indicating the course of evolution, is to my mind wrongly interpreted or at least doubtful in other cases, and with the more detailed knowledge now available, one may say that the attempt at getting at the cause of this evolution is a failure and the mechanism of evolution has not been touched upon. In fact, though the study of the genus attracted me from a genetic point of view especially, I must frankly confess that I have come to the conclusion that morphological (including anatomical), geographical, and ecological facts are not sufficient to give a clear insight into the evolution of our species of *Rhus*. Perhaps cultures on a large scale and cytological investigations, neither of which I have touched, will help to bring about the desired result. Under the circumstances I do not feel justified in following Diels' example by trying to form as it were a genealogical tree of the species. At the same time I can recommend Diels' account to students of the genus, who cannot fail to be stimulated by it, and who will find many interesting facts in it which I have not included in this paper.

While thus, to recapitulate, the evolution of our species of *Rhus* for the present largely evades our grasp, it seems evident that the majority of the South African species have been evolved *in* South Africa, and this, as stated before, applies also to some of the groups. A separation of the *Mucronata* and *Natalensis* groups evidently has, however, taken place long before the genus reached South Africa.

To show the probable *relationship of the groups* represented in South Africa the following scheme has been drawn up :—



SHORT DESCRIPTIONS OF GROUPS AND KEYS OF THE SPECIES.

MUCRONATA group.

Shrubs or rarely trees, unarmed or rarely thorny, often more or less hairy, but the hairs in many species become less or disappear altogether on the adult leaflets and other

adult organs. Petioles canaliculate above, rarely slightly winged. Leaflets membranous or rarely subcoriaceous, generally entire, more or less obovate, rarely sublanceolate, tertiary veins generally distinct (unless obscured by hairs) and reticulate. Panicles lax or densely multiflowered. Drupes glabrous, subglobose or slightly compressed.

DISTRIBUTION: Widely spread in South Africa, absent in the arid north-western and western parts; also widely spread in Tropical Africa.

A.—Panicles lax, shorter or slightly longer than the leaves.

(*a*) Leaflets oblong-lanceolate or oblanceolate.

α Leaflets at first villous, later pilose..... 11. *Rh. Rudatisii* Engl.

β Leaflets glabrous..... 1. *Rh. mucronata* Thunb., B. *laevigata* (L.) Schonl.

(*b*) Leaflets broad, usually obovate.

α Adult leaflets densely villous.

1. Hairs fairly uniform all over..... 4. *Rh. mucronata* Thunb., E. *villosa* (L.f.) Schonl.

2. Midrib and the larger veins covered with lighter, straight hairs..... 2. *Rh. Ernesti* Schonl.

β Adult leaflets more or less hairy or glabrous.

1. Drupes 5–5·5 m.m. in diam..... 1. *Rh. mucronata* Thunb.

2. Drupes 3–3½ mm. in greatest diam.

x. Mature leaflets quite glabrous, coriaceous.

o. Branchlets subterete..... 10. *Rh. dura* Schonl.

oo. Branchlets angular..... 9. *Rh. krebsiana* Licht.

xx. Mature leaflets more or less covered with fine, often appressed hairs.

o. Tertiary veins very coarsely reticulate. Leaflets subcoriaceous. 8. *Rh. nebulosa* Schonl.

oo. Tertiary veins delicately reticulate. Leaflets membranous.

† Petioles less than half the length of the leaflets..... 6. *Rh. pyroides* Burch.

†† Petioles slender, more than half the length of the terminal leaflets.... 7. *Rh. Baurii* Schonl.

B.—Panicles densely multiflowered, terminal much longer than the leaves and greatest diam. of fruit about 3 mm.

(*a*) Leaflets oblong or obovate, acuminate, cuneate (the cuneate base often at least half the length of the leaflet), often with a few gross mucronulate teeth at the apex. Petiole 1–2 cm. long..... 4. *Rh. Fraseri* Schonl.

(*b*) Leaflets ovate or obovate, obtuse, acute or acuminate, generally entire.

α Petioles about 1·5 cm. long..... 3. *Rh. MacOwani* Schonl.

β Petioles 2·3–4 cm. long..... 5. *Rh. intermedia* Schonl.

DENTATA group.

Glabrous or hairy shrubs. Petiole canaliculate above, rarely slightly winged. Leaflets membranous or coriaceous, rarely slightly fleshy, obovate, ovate, oblong-cuneate or cuneate, usually in the upper portion crenato-dentate. Tertiary veins reticulate. Panicles multiramose, lax or densely multi-flowered, the axillary shorter than the leaves, the terminal longer.

DISTRIBUTION : Chiefly on the edges of open bush and forests and in stream-bank scrub in the coast districts from the Zitzikamma to Swaziland, in the mountainous parts of south-eastern Cape Province and Natal, extending along the Drakensberg to the northern Transvaal, ; also in the eastern Orange Free State.

A.—Quite glabrous. Leaflets oblong or obovate, more or less grossly dentate in the upper part, slightly fleshy when fresh. Drupe about 5 mm. in diam..... 13. *Rh. carnosula* Schonl.

B.—Branchlets pilose. Leafflets oblong-cuneate or obcuneate, coriaceous, upper part more or less crenato-dentate..... 14. *Rh. Rogersii* Schonl.

C.—Branchlets glabrous or subglabrous. Leaflets oblong-ovate, undulate, entire..... 15. *Rh. ntsubanensis* Schonl.

C.—Quite glabrous or more or less hairy. Leaflets membranous, very variable in shape, usually obovate-cuneate and more or less dentate, if entire much smaller than in *Rh. ntsubanensis*. Drupe about 4 mm. in diam..... 12. *Rh. dentata* Thunb.

REFRACTA group.

Richly branched, usually unarmed shrubs with comparatively small leaves. Petioles not winged, rarely slightly exceeding 1 cm. in length. Leaflets membranous or subcoriaceous, ovate, obovate or oblong, more or less hairy when young, subglabrous or glabrous when adult. Terminal leaflets rarely exceeding 2·2 cm. in length. Panicles lax, rarely multi-flowered. Drupe, where known, subglobose, fleshy, glabrous (in one species tipped with the styles).

DISTRIBUTION : Coast districts of South Africa from the Cape Peninsula to Natal and mountainous parts of south-eastern Cape Province and Natal, slightly extending into the Orange Free State and the Transvaal. One species in the South-West Protectorate,.

Of the species belonging here, Diels has only classified *Rh. crenata*. He places it (l.c. 630) into his *Crenata* group with *Rh. natalensis*. This, to my mind, is an artificial association, though in both glandular hairs are predominant on the leaflets, the margins of which are crenate. The group, as here constituted, is very close to the *Mucronata* group. *Rh. refracta* especially can hardly be kept out of it. The *Refracta* group might also be united with the *Eckloniana* group.

A.—Petioles about 2 mm. long. Leaflets obovate-cuneate, tricrenate at the blunt apex..... 19. *Rh. crenata* Thunb.

B.—Petioles 5 or more mm. long.

(*a*) Adult leaflets greyish pubescent..... 18. *Rh. Dinteri* Engl.

(*b*) Adult leaflets dark green above, whitish or fulvous tomentose below..... 21. *Rh. divaricata* E. et Z.

(*c*) Adult leaflets dark green above, paler green below.

α Leaflets entire, oblong or elliptic-lanceolate, terminal 2–3 cm. long..... 17. *Rh. fastigiata* E. et Z.

β Leaflets obovate-cuneate, usually entire, rarely crenulate towards the apex, terminal 1·2–2·2 cm. long, somewhat larger in specimens growing near the sea..... 16. *Rh. refracta* E. et Z.

γ Leaflets elongated obovate-cuneate, tridentate or emarginate at the blunt apex, terminal 2–3 cm. long..... 20. *Rh. Pentheri* Zahlbr.

δ Leaflets broadly obovate or obovate-elliptical, entire, terminal about 1·3 cm. long..... 22. *Rh. rupicola* Wood et Evans.

LEGATI group.

Shrubs or trees, mostly glabrous in all mature parts. Petioles not winged. Leaflets membranous or subcoriaceous, usually quite entire, obovate or obovate oblong, acuminate, narrowed at the base, sometimes petiolulate, tertiary veins reticulate. Panicles large and much divided, multiflowered in one species, very lax and usually smaller than the leaves in the two others. Drupes shining, glabrous, subglobose or globose.

Distribution: *Rh. Legati* (*Rh. laevigata* Thunb. non Linn.) is found in all forest patches and often in stream-bank bush from Swellendam to Natal and the northern Transvaal; the two others are restricted to the eastern parts of the Drakensberg and the neighbourhood of Pretoria.

Diels (l.c. 638) refers all three species to his *Laevigata* group, but also puts under this group a number of other species which I have placed elsewhere.

A.—Perfectly glabrous or rarely with slightly pilose branchlets.
- (*a*) Leaflets green or partly reddish, slightly undulate, the terminal 7–13 cm. long ..... 23. *Rh. Legati* Schonl.
- (*b*) Leaflets glaucous, the terminal 2–3 cm. (rarely up to 6 cm. long) ..... 25. *Rh. Zeyheri* Sond.

B.—Branchlets at first villous, later glabrescent. Leaflets green, the terminal 2·5–4 cm. long ..... 24. *Rh. transvaalensis* Engl.

LUCIDA group.

Much branched unarmed shrubs, usually with predominance of glands over hairs. Petioles channelled above and more or less winged. Leaflets often "varnished", subcoriaceous or coriaceous, rarely membranous, obovate-cuneate, lanceolate-cuneate or obcordate-cuneate, entire or rarely dentate, with lateral veins distinct, butt ertiary veins rarely visible. Panicles lax, shorter or slightly longer than the leaves.

Distribution: Common in open bush and on the edges of forest in the coast districts from south-western Cape Province to Natal and Gazaland. One species widely spread in the more arid portions of western and central portions of South Africa extending to the South-West Protectorate.

Diels (l.c. 632) has placed most of the species here united into his *Lucida* group, to which he also refers *Rh. horrida*, *Rh. longispina* and *Rh. cuneifolia*. On the other hand, he placed *Rh. celastroides* Sond., which, in my opinion, is only a variety of *Rh. undulata*, into his *Pyroides* group next to *Rh. mucronata*.

A.—Leaflets lanceolate-cuneate, acute or emarginate, entire, rarely ovate, dentate, membranous in the coastal forms .. 32. *Rh. undulata* Jacq.

B.—Leaflets obcordate-cuneate.
- (*a*) Greatest diam. of drupe about 3 mm ..... 32. *Rh. undulata* Jacq. var.
- (*b*) Greatest diam. of drupe about 5 mm ..... 31. *Rh. glauca* Desf.

C.—Leaflets more or less obovate-cuneate.
- (*a*) Leaflets practically sessile ..... 27. *Rh. Schlechteri* Diels.
- (*b*) Leaflets distinctly petioled.
  - *α* Petals 1¼–1½ mm. long.
    1. Petioles slightly winged. Leaflets subcoriaceous with lateral veins delicate, though distinct ..... 26. *Rh. lucida* L.
    2. Petioles broadly winged. Leaflets coriaceous, lateral veins usually prominent on both surfaces ..... 30. *Rh. scytophylla* E. et Z.

β Petals about 2 mm. long.

1. Glabrous. Leaflets with thickened white revolute margin..... 29. *Rh. albomarginata* Sond.
2. Branchlets, panicles, etc., hairy..... 28. *Rh. africana* Mill.

ECKLONIANA group.

Shrubs, one species dwarf, rarely small trees, usually unarmed and usually with comparatively small leaves. Petioles subterete or slightly winged. Leaflets membranous or subcoriaceous, glabrous or pilose, entire or slightly crenato-dentate, oblong, lanceolate or oblong-lanceolate rarely exceeding 3 cm. in length. Panicles lax, shorter or longer than the leaves. Drupes glabrous, subglobose, shining.

Distribution: Transvaal, one species also in the Cape Province from the Uitenhage to the Albany District.

Diels (l.c. 627) placed *Rh. Engleri* Britt. (=*Rh. incana* Engl.) into his *Pyroides* group, without, however, indicating close relationships with any other species. *Rh. eckloniana* Sond. was not classified by him.

A.—Branchlets and leaflets greyish pilose. Drupe about 3 mm. in diam..... 34. *Rh. Engleri* Britt.

B.—Branchlets pubescent. Leaflets deep green above, paler below, sparsely pilose. Drupe about 3 mm. in diam.... 35. *Rh. eburnea* Schonl.

C.—Branchlets and leaflets glabrous or more or less pubescent. Leaflets deep green above, slightly paler below, often folded along the midrib. Drupe 5·5-6 mm. in diam..... 33. *Rh. eckloniana* Sond.

NATALENSIS group.

Shrubs, rarely small trees, often with more or less greyish or glaucous foliage. Petioles subterete or broadly canaliculate above. Leaflets subcoriaceous, generally more or less oblong, rarely ovate or obovate, almost always crenate, glabrous or more or less pubescent. Tertiary veins rarely distinctly reticulate, often not visible. Panicles generally lax and not exceeding the length of the leaves or slightly longer. Drupes glabrous, shining, in two species sometimes retaining the styles (compare *Populifolia* and *Horrida* groups).

Distribution: South-West Protectorate, Bechuanaland, Transvaal, coast of temperate South Africa from East London to the Tropics, and strongly represented in many parts of Tropical Africa.

Diels places *Rh. natalensis* into his *Crenata* group and *Rh. Marlothii* into his *Damarenses* group.

A.—Leaflets ovate or obovate, greyish, softly pubescent..... 40. *Rh. commiphoroides* Engl. et Gilg.

B.—Leaflets oblong-cuneate, dark green above, glabrous..... 36. *Rh. natalensis* Bernh.

C.—Leaflets obovate oblong or sublanceolate or oblanceolate, often glaucous, puberulous or glabrous.

(*a*) Drupe strongly compressed, often asymmetrical and sometimes with persistent styles..... 39. *Rh. Marlothii* Engl.

(*b*) Drupe subglobose, c. 3·5 mm. in diam..... 37. *Rh. Simii* Schonl.

(*c*) Drupe subglobose, sometimes retaining the styles, c. 4 mm. in diam..... 38. *Rh. spinescens* Diels.

LANCEA group.

Shrubs or small trees, usually glabrous or subglabrous, mostly unarmed. Branchlets generally slender, rarely whole plant slender and almost unbranched. Petioles canaliculate,

sometimes slightly winged. Leaflets linear or lanceolate-cuneate, rarely oblong, sometimes slightly falcate, entire, dentate or crenate, when mature generally glabrous or subglabrous. Panicles lax. Drupes glabrous, subglobose, sometimes slightly compressed or depressed.

DISTRIBUTION: Chiefly in the Transvaal and Natal (above 3,000 feet), mountains and hilly parts of south-eastern Cape Province, and through the arid interior parts of South Africa to Clanwilliam and Namaqualand, one species extending to Tropical Africa.

Diels includes *Rh. ciliata* in his *Pyroides* group (l.c. 627) and *Rh. gracillima* in his *Tomentosa* group (l.c. 613); the other members of the *Lancea* group, as far as they have been classified by him, he places into his *Laevigata* group (l.c. 638)—*Rh. viminalis* is allied to *Rh. retinorrhoea* Steud., a Tropical African species.

A.—Slender, almost unbranched shrublets.

(*a*) Petioles 5–7 mm. long ..... 51. *Rh. gracillima* Engl.
(*b*) Petioles 2–5 cm. long.
α Leaflets suddenly contracted at the apex, lateral veins prominent on both surfaces ..... 52. *Rh. Wilmsii* Diels.
β Leaflets acute at the apex, lateral veins a little prominent or more often immersed ..... 53. *Rh. Keetii* Schonl.

B.—Much branched shrubs or trees.

(*a*) Margin of leaflets crisped and sometimes slightly and irregularly dentate ..... 46. *Rh. crispa* Harv.
(*b*) Leaflets not crisped.
α Margin of the leaflets eroso-dentate ..... 49. *Rh. erosa* Thunb.
β Margin of the leaflets serrato-dentate, leaflets obovate oblong or oblong ..... 50. *Rh. Bolusii* Sond.
γ Margin of leaflets with a blunt tooth at the end of each lateral vein ..... 44. *Rh. Gueinzii* Sond.
δ Margin of leaflets irregularly and usually sparsely crenato-dentate ..... 43. *Rh. Gerrardi* Harv.
ε Margin of leaflets entire.
1. Leaflets sessile.
x. Branchlets subvillous. Leaflets oblong or obovate, when mature sparsely pilose ..... 45. *Rh. microcarpa* Schonl.
xx. Quite glabrous or with puberulous branchlets. Leaflets linear or lanceolate, rarely oblong, glabrous or puberulous, rarely exceeding 2·5 cm. in length ..... 47. *Rh. ciliata* Licht.
xxx. Quite glabrous. Leaflets narrowly linear, often falcate, the terminal 3·5–6 cm. long ..... 48. *Rh. dregeana* Sond.
2. Leaflets petiolulate, quite glabrous or sparsely hairy.
x. Terminal leaflets 4–8 cm. long ..... 42. *Rh. viminalis* Vahl.
xx. Terminal leaflets 9–12 cm. long ..... 41. *Rh. lancea* L.f.

HORRIDA group.

Squarrose or erect, thorny or unarmed shrubs, with young parts covered with glandular, often red, hairs or tomentose. Petioles winged or margined. Leaflets coriaceous or subcoriaceous, obovate-cuneate or linear-cuneate, entire. Panicles lax, usually shorter than the leaves. Drupes glabrous, subglobose or oblique, often crowned with the hardened styles.

DISTRIBUTION: One species in the semi-arid parts of the coast districts from Swellendam to East London, penetrating inland to Graaff-Reinet, two in Namaqualand and Bushmanland, one in the Transvaal.

Diels (l.c. 632) places *Rh. longispina* next to *Rh. lucida* in his *Lucida* group, while *Rh. horrida* was placed by him in the same group next to *Rh. rigida*, which he considers as derived from *Rh. scoparia*. I do not think these relationships hold good. *Rh. longispina* and *Rh. horrida* seem to be closely related. The former again appears to be related to *Rh. ciliata* Licht. (in which ordinary hairs are often absent), and thus there would be established a connection with the *Lancea* group. *Rh. rigida* has been placed in the *Horrida* group, because like the two previously mentioned species it is also without ordinary hairs, though the glandular hairs are not so conspicuous. Its drupe bears the thickened and hardened styles, as is often the case in *Rh. horrida* and *longispina* (compare also the *Populifolia* group). In its vegetative organs it approaches closely some forms of *Rh. magalismontana*, but I am somewhat doubtful whether this should have been included here, because its drupe does not bear the styles and the young parts are shortly tomentose. Diels placed it (l.c. 627) as *Rh. burkeana* next to *Rh. ciliata* in his *Pyroides* group.

A.—Young parts shortly tomentose, drupe not bearing the styles.

Unarmed shrub..... 57. *Rh. magalismontana* Sond.

B.—Young parts glandular.

(*a*) Erect, rigid, unarmed shrub. Petioles narrowly margined. Leaflets cuneate-lanceolate or lanceolate, terminal 4–5 cm. long..... 56. *Rh. rigida* Mill.

(*b*) Squarrose, usually thorny shrubs. Petioles usually distinctly winged.

α Terminal leaflets 4–8 mm. long..... 54. *Rh. horrida* E. et Z.

β Terminal leaflets 1–5 cm. long (usually about 2·5 cm.)..... 55. *Rh. longispina* E. et Z.

DISCOLOR group.

Small, unarmed, poorly branched shrubs, one species more or less tomentose, the other glabrous. Leaflets subcoriaceous, linear-lanceolate, lanceolate or oblong, rarely obovate, always more or less cuneate at the base, entire or sparingly toothed. Lateral veins numerous and often very conspicuous. Panicles dense or lax, shorter or slightly longer than the leaves. Drupes subglobose, sometimes puberulous when young.

DISTRIBUTION: Amongst grass in the mountains of south-eastern Cape Province, Transkei, Pondoland, Natal, Drakensberg Range, Orange Free State, Transvaal.

Diels (l.c. 614) placed *Rh. discolor* into his *Tomentosa* group. The group includes some species found in Tropical Africa.

A.—Leaflets (at least on the under side) tomentose..... 58. *Rh. discolor* E. Mey.

B.—Leaflets glabrous..... 59. *Rh. pondoensis* Schonl.

TOMENTOSA group.

Unarmed shrubs (some dwarf) or small trees. Petioles subterete. Leaflets tomentose on the under side, glabrous or subglabrous when mature on the upper, generally subcoriaceous, elliptical, ovate, obovate, linear or linear-lanceolate, entire or slightly dentate or pinnatifid, sometimes petiolulate. Panicles longer than the leaves, densely multiflowered. Drupes villous or densely greyish or fulvous tomentose (very rarely glabrous), subglobose or somewhat oblique.

Distribution: Hills of the coast districts from Namaqualand to the Transkei, but mainly south-western.

Diels (l.c. 613) places all the species here enumerated into his *Tomentosa* group, to which he also refers a number of other species which I have excluded.

A.—Leaflets narrowly linear or linear-lanceolate, entire or with one or two sharp teeth..... 63. *Rh. rosmarinifolia* Vahl.

B.—Leaflets lanceolate or narrowly elliptical..... 61. *Rh. angustifolia* L.

C.—Leaflets more or less ovate or obovate in outline, rarely elliptical.

(*a*) Leaflets entire or above the middle, more or less coarsely, serrate. Drupes greyish tomentose..... 60. *Rh. tomentosa* L.

(*b*) Leaflets more or less pinnatifid with obtuse lobes or nearly entire with small triangular often obtuse teeth, rarely quite entire. Drupes villous..... 62. *Rh. incisa* L.f.

POPULIFOLIA group.

Unarmed shrubs. Petioles subterete, slightly canaliculate above, sometimes slightly winged. Leaflets coriaceous or subcoriaceous, obovate, suborbiculate or subrhomboid, often cuneate or even petiolulate at the base, glabrous or subglabrous above, tomentose or glabrous below, crenate, dentate or even pinnatifid, rarely entire, midrib and lateral veins prominent, especially on the lower side. Panicles lax, shorter or longer than the leaves. Drupe oblique, crowned by the slightly enlarged and hardened styles, glabrous or puberulous, smooth or verrucose.

Distribution: Caledon, Stellenbosch, Worcester, Malmesbury, and Clanwilliam districts, Namaqualand, Bushmanland, South-West Protectorate.

Diels (l.c. 613) includes *Rh. populifolia* (with which I unite *Rh. Steingroeveri* Engl.) and *Rh. dissecta* in his *Tomentosa* group, while *Rh. cuneifolia* is placed by him into his *Lucida* group between *Rh. lucida* L. and *Rh. scytophylla* E. et Z., for which I can see no adequate reason, as he himself has pointed out (l.c. 596) that no reliance can be placed on the indument in dealing with the taxonomy of *Rhus*.

A.—Petioles longer than the terminal leaflets..... 65. *Rh. dissecta* Thunb.

B.—Petioles shorter than the terminal leaflets.

(*a*) Greatest diam. of fruit 5–6 mm. Petioles $\frac{3}{4}$–1 cm. long. 64. *Rh. populifolia* E. Mey.

(*b*) Greatest diam. of fruit 6–8 mm. Petioles $\frac{1}{2}$–4 mm. long. 66. *Rh. cuneifolia* Thunb.

MUCRONATA group.

1. **Rh. mucronata** Thunb. (charact. emend.).

Remarks on *Rhus villosa* L.f., *Rh. mucronata* Thunb., *Rh. laevigata* L. (non Thunb.), and some other forms distinguished by various authors as separate species.

Rh. villosa L.f. [suppl. 183 (1781)] is supposed by many authors to occur from the south-west corner of Cape Colony to Abyssinia. Diels, in his valuable evolutionary studies on *Rhus* § *Gerontogeae* Engl. (in Engl. Bot. Jahrb. XXIV, 1898, 586), takes this species as a starting point from which the majority of African species are supposed to have been derived by adaptation. It is, therefore, of some importance to determine as accurately as possible what is meant by *Rh. villosa* L.f.

In the Linnean Herbarium, London (No. 26), there is a villous specimen named *Rh. villosum*. Unfortunately the name is in Smith's handwriting not in that of Linn. f. However, I am quite prepared to take this as the type of Linn. f., who first published it, though the name was given by Thunberg, from whom Linn. f. received many of his specimens.

In Jacquin's herbarium the same form is named *Rh. villosa*. In the herbarium of Thunberg, Upsala, there are two sheets marked *Rh. villosum*. On fol. *α* the leaflets are not villous, they are only slightly hairy. On fol. *β* the young branches, petioles, leaflets, etc., are villous, but it seems to me to be the species which I have called *Rh. MacOwani*, with which it shares the pyramidal many-flowered terminal inflorescence and the many-flowered lateral inflorescences. In Willdenow's herbarium, Berlin, there are specimens received from Thunberg which are a similar mixture as found in Thunberg's herbarium. In the Sloane collection at the British Museum there is a specimen marked "*Rhus incanum* Mill. dict. ed. 8 n. 8 (1760), Ray H. S. D 58, 14—Tab. 219, fig. 8". The last reference is to Plukenet Alm. 319 t. 219, fig. 8 (1691). It is evidently Plukenet's own specimen, but without flowers and fruit. However, it agrees sufficiently with the specimen in the Linnean collection that J. Britten was induced to dig out Miller's name, *Rh. incana*, and substitute it for *Rh. villosa*. (At the same time he changed *Rh. incana* Engl. into *Rh. Engleri*—see Journ. of Bot. XXXVIII, 1900, 316.) This, however, is only a side issue. The origin of Plukenet's specimen must be sought for in the neighbourhood of Capetown, and there we find the same form still.

It looks at first sight as if it was a pity that the very expressive name *Rh. villosa* has to be dropped, but even near Capetown this species is not always villous, and this introduces us to one of the difficulties encountered in dealing with this species. Already Sonder (l.c. 510) had distinguished a var. *glabrata*, which he identified with *Rh. pubescens* Thunb.* (Prodr. 52, Fl. Cap. ed. Schultes 265.) In this "variety" the leaves are glabrous or subglabrous. In March, 1925, two forms were sent by Dr. Marloth (11922 A, slopes of Table Mountain, shrub, 8 feet, and 11922 B, ib., compact low shrub, 3 feet) with the following remarks :—"On a walk yesterday I found two bushes of *Rhus* close together. Though quite different in habit I found on closer examination no other difference but their hairiness. A would be *Rh. villosa* (by a slip Marloth put *tomentosa*), B would be *Rh. mucronata*, but even this shows a few hairs on the petioles. The fresh fruits of both are the same, globular slightly flattened on the poles. A still bears the galls of the insect which produces the "jumping eggs".† B has slightly but distinctly winged petioles which seem to go frequently with the glabrescent form, but even A is not so distinctly villous all over the leaflets as the type of *Rh. villosa* L.f.

When one goes further into the matter one finds it quite impossible to separate *Rh. mucronata* Thunb. from *Rh. incana*, although the former in Thunberg's‡ types appear to be quite glabrous, and only on very careful examination does one find a few scattered hairs on the petioles. A separation into two varieties as done by Sonder (l.c. 513) with the aid of Thunberg's originals is quite unjustified. There is still a further complication. Linnaeus has described a *Rh. laevigatum* which is quite different from the well-known species described under the same name by Thunberg. According to the author it has lanceolate leaflets, whereas in *Rh. incana* and *mucronata* they are more or less obovate-cuneate. The type in Herb. Linnaeus, London, has inflorescences like *Rh. incana* and *Rh. mucronata*. The flowers do not seem to be fully developed. Now this is the plant which Jacquin in Hort. Schoenbr. t. 345 figured as *Rh. elongata* and which Sonder (l.c. 513) made his *Rh. mucronata* var. *Jacquini*, under which he also placed the specimens of *Rh. mucronata* Thunb. fol. *β*. As a matter of fact, even in Linnaeus' specimens the leaflets are not strictly

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* This species is not represented in Thunberg's Herb. and his description is insufficient.

† However, in January, 1928, he wrote: "As regards Nos. 11922 A and B. If one sees the two shrubs without examining them closely" (they agree in inflorescence, flower, and fruit) "one could always suspect two species and yet you put them both simply under var. *latifolia*. B has yellowish green or deep green foilage, almost shining; A is a taller upright shrub with greyish foliage often covered with galls (moths galls), while I have not seen any galls on B, in spite of the fact that this is glabrous and apparently softer. Form A has the further peculiarity that in exposed places it sheds its leaves in winter and about a month elapses before the new leaves appear."

‡ There is a slip in Thunberg's description (Fl. Cap. ed. Schultes 265) *Rh. mucronata*: for "petioli" in the third line read "pedicelli".

lanceolate, although, again, Jacquin described the leaflets of *Rh. elongata* as lanceolate. Sonder is wrong in describing them as obovate. I have seen also Jacquin's types, and I quite agree that specifically they cannot be separated from *Rh. mucronata* Thunb. We can thus form an unbroken series from *Rh. incana* Mill. to *Rh. laevigata* Linn. (non Thunb.). Whether we are dealing here with a very variable species or whether there are several distinct species which hybridize freely cannot be decided without growing the various forms for years and subjecting them to cytological investigations. The species seems to be very sensitive to changes in ecological conditions. I have never seen a native specimen which is exactly like *Rh. laevigata* L., though one from Kirstenbosch (a damp locality) is very near it ; but in the older European herbaria we often meet it under its right name. However, these specimens were all derived from European gardens.

Looking upon these diverse forms as members of one polymorphous species, the question arises what name to give it.

Rh. laevigata L.—This name has for over a hundred years been applied to quite a different species. The form which it represents has not been found wild in South Africa. It is a most inappropriate name as regards the villous form.

Rh. mucronata Thunb.—The occurrence of a mucro on the leaflets is very common in this " collective " species, though also found in numerous other species of *Rhus*. If the name was adopted it would, however, cover, what I may call, the major part of the species.

Rh. incana Mill. (*Rh. villosa* L.f.).—This is the oldest name. This form is only found in the neighbourhood of Capetown. I have examined a vast amount of material from Tropical Africa, and I am not satisfied that the large number of forms referred to this species can be legitimately associated with it directly, and if these two names are dropped we clear away at once the misunderstanding about its distribution which has crept into botanical literature. I may add, however, that the time is not ripe to deal again with the Tropical African species referred to *Rh. villosa*, because the material available, large as it is, is on the whole far too incomplete and frequently unaccompanied by detailed notes. As regards South African species *Rh. MacOwani* Schonl. (=*Rh. pubescens* E. and Z. non Thunb.) has frequently been mixed up with *Rh. villosa* L.f.

Assuming that this species easily responds to edaphic influences we may safely place with it such forms as have been described by Jacquin as *Rh. atomaria* in Hort. Schoenbr. t. 343.

In these forms which have somewhat thinner leaves than is generally found in the species, the petioles have a tendency to become longer and thinner. Mrs. Bolus sent a fair match of *Rh. atomaria* from Kirstenbosch, which has a high rainfall. On the other hand, specimens from sand-dunes and other xerophytic habitats have a tendency to form coriaceous leaves showing the coarse reticulation of the veins very plainly.

To my mind it will be best to adopt Thunberg's name, *Rh. mucronata* Thunb., and to deal with it under the following forms : A. *typica*, B. *laevigata* (=*Rh. laevigata* L.), C. *atomaria* (= *Rh. atomaria* Jacq.), D. *latifolia*, E. *villosa* (=*Rh. incana* Mill., *Rh. villosa* L.f.).

Rh. mucronata Thunb. in Fl. Cap. ed. Schultes, 264 (species collectiva, charact. emend., non E. et Z. 1129). For synonyms see varieties below.

Description : A much branched, unarmed or somewhat spiny shrub, 2–8 feet high, villous, glabrous or glabrescent, with terete branchlets. Leaflets petiolate, petioles $\frac{1}{2}$–$\frac{2}{3}$ the length of the terminal leaflets, canaliculate above with a tendency in the glabrous forms to produce narrow wings. Leaflets generally subcoriaceous, obovate, broadly oblong or lanceolate, always with a more or less cuneate base and frequently acuminate at the apex, rarely acute, generally mucronulate, margin slightly revolute usually entire ; midrib prominent on the lower surface, sometimes on both, lateral veins very slightly prominent, much broken and forming with the tertiary veins a coarse network, conspicuous in glabrous

or subglabrous forms. Panicles very lax, axillary shorter than the leaves, terminal generally longer. Flowers pedicellate, calyx lobes ovate obtuse, petals oblong, yellowish green. Drupe subglobose, very slightly depressed.

Length of petioles 8–15 mm. ; terminal leaflets generally 2·5–3·5 cm. ; lateral leaflets very variable.
Breadth of terminal leaflets generally 2–3 cm. ; lateral leaflets very variable.
Length of calyx lobes about $\frac{3}{4}$ mm. ; petals $1\frac{1}{2}$–2 mm.
Diameter of drupe 5–5·5 mm.

Distribution : South-west Cape Colony in the coast districts to East London, generally found not far from the sea.*

Before dealing with the varieties some remarks on a few specimens may be here inserted to show further that a clear distinction between them is impossible.

E. & Z. 741 (wrongly named *Rhus pendulina* Jacq.) in Herb. S.A. Mus. There are three branches, all from the dunes near Cape Recief, and apparently rightly associated with one another, but *one is quite glabrous*. The leaflets are either obtuse, mucronate or emarginate. Two have *villous inflorescences* (with glabrous flowers) and more or less villous petioles ; the leaflets are mostly obtuse (with or without a mucro), some are glabrous, others are pilose on the thick recurved margin and on the midrib of the underside.

E. & Z. 1101 (described as *Rhus Burmanni* DC. Prod. 2, 69) in scrub in the 2d. alt. on the Lion's Head, Nov., in S.A. Mus. Herb., is rather scrappy, very sparingly hairy, but seems to be indistinguishable from the glabrous form of E. & Z. 741.

Pappe 22 (identified in Herb. S.A. Mus. with E. & Z. 1101, evidently by Harvey) from the sides of Table Mt., Nov., consists of two specimens, one of which is similar to the glabrous form of 741, but has evidently thinner leaves in which the lateral veins are not so coarse as in 741. The other specimen has narrower leaves and both evidently represent a shade form. The flowers in all of them appear to be the same. The petioles in all of them are broadly furrowed above.

Pappe 22 in Herb. Alb. Mus. consists of two specimens. One, in young fruit, is quite glabrous. In the other there are a few flowers which do not seem to differ from those of typical *mucronata* : the branches seem to be young. They are densely villous as well as the petioles and even the leaflets are more or less villous, especially on the underside ; otherwise the leaves, though smaller and younger than in the glabrous branch, do not show any essential differences.

Forester Norris (5096), Bellville Flats, near Capetown, formerly white drift sand, Feb. alt. c. 90 feet :—

Leaflets glabrous, terminal about 3·5 cm. long, pale green above, still paler below midrib and veins reddish. Apex generally acuminate or mucronate or rarely slightly emarginate. Venation boldly reticulate. Petiole canaliculate above, sometimes faintly marginate. Inflorescence sparingly hairy. Drupe rather dry, pale yellow, turning into red, globular, about 5·5 mm. in diam.

Coppice shoots about a year old included in (5096) are quite different in appearance (though some fruiting branches are intermediate).

Leaflets much longer (terminal about 4·8 cm. long), softer and much thinner than in fruiting branches, frequently with one or two crenate teeth, petiole distinctly winged in upper part. Venation at first sight pinnate, but reticulations are seen faintly in transmitted light.

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* Marloth (Das Kapland 1908, 133) states that *Rh. mucronata* is found in the dwarf macchia on the granite and limestone hills of the South-West as far as Saldanha Bay. Further, on p. 326, that this species is bare for about two months in winter, but sometimes the old leaves remain until the young ones have appeared, and that *Rh. villosa*, also an inhabitant of the macchia, loses its leaves in June, but replaces them already the next month.

" Deeply rooted, difficult to eradicate. Average height 10 feet. Locally known as Duinen Taaibosch. Straight stems are used by natives to make strong kerries, long ones are used for whipsticks ".

As stated above, I propose to divide the species into five varieties.

A. *typica*. *Rh. mucronata* Thunb. in Fl. Cap., ed Schultes, 264; *Rh. Burmanni** DC. in Prodr. II, 69; *Rh. Burmanni* et *pendulina* E. & Z. in Enum. No. 1101 and 1102; *Rh. Eckloniana, tenuiflora* et *pilipes* Presl, Bem. (teste Harvey); *Rh. lucidum* Ait. hort. Kew, ed. 2, 166 (teste Engler).

Leaflets generally obovate, their breadth less than half their length subcoriaceous, quite glabrous or with very few minute hairs on the petioles or other parts. Apex obtuse or acuminate, rarely subacute.

Rh. mucronata Thunb., A. *typica, a genuina*. Muller (5116). Under side.

Rh. mucronata Thunb., A. *typica, a genuina*. MacOwan 1303. Upper side.

Rh. mucronatum fol. α and β in Herb. Thunberg; sand dunes, Cape Flats, Marloth 11973, Lion's Head and Table Mountain, E. and Z. 1101, 1102; slopes of Devil's Peak, 1,400 feet, height c. 4 feet, very common; Dec. (fl.), ? (4490); Cape Flats, on light sandy loam about 2 miles from False Bay, Van Roeper (5059, 5063) [These are a very good match of *Rh. mucronatum* Thunb. fol. α and very similar to *Rh. foetida* Herb. Jacquin]; Caecilia plantation, Capetown, 4481; Uitvlugt, Cape Division, in sandy soil common, average height 6 feet, Muller (5115, 5116) [a good match of *Rh. mucronatum* Thunb. fol. β, which has slightly larger leaves than α, but there is no really tangible difference].

B. *laevigata*. *Rh. laevigata* L. (non Thunb.) in Sp. Pl. ed. 2 (1762); *Rh. elongata* Jacq. in Hort. Schoenbr. t. 345; *Rh. mucronata* β *Jacquini* Sond. l.c. 513 (p. pte.).

Leaflets subcoriaceous glabrous, oblong lanceolate, cuneate in lower half.

Herb. Linnaeus, London; Herb. Willdenow, Berlin; Herb. Jacquin, Vienna (*Rh. elongata* Jacq.). The nearest specimen collected in South Africa was contributed by Mrs. F. Bolus from Kirstenbosch (4475 in Herb. Alb. Mus.).

C. *atomaria*. *Rh. atomaria* Jacq. in Hort. Schoenbr. t. 343.

Leaves with somewhat more slender petioles than in A. Leaflets submembranous, resembling those of A in shape, subvillous on both surfaces.

Herb. Jacquin; Kirstenbosch, Mrs. F. Bolus (4474); Table Mountain, Pappe 13 (= Z. 347 from Zwartland).

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* All reference to Burm. Afr. t. fig. 2 is perhaps in future better omitted, since it is clear that, if it is meant to represent the same species as *Rh. mucronata* Thunb., it is a very bad figure, and it appears further from the letterpress that Burmann, like other earlier authors, lumped together different species.

D. *latifolia*. Breadth of leaflets half or more of length. Young branchlets, petioles, leaflets and inflorescences villous, older pilose or often glabrescent, generally blunt,.

Rh. mucronata Thunb., D. *latifolia*. Pillans (5012). Upper side.

Slopes of Table Mountain, Marloth 11992 A and B ; Kommetjes, Cape, Pillans (5012) ; above Camps Bay, Rogers 3032 ; Knysna Heads, Schonland 3527. 3532 ; Redhouse, Paterson 523*a* ; Sandhills, Port Alfred West, Galpin 2941 ; East London, Rattray 178.

E. *villosa*. *Rh. villosa* L.f. suppl. 183 (non auct. plur.) ; Thunberg in Prodr. 52, Fl. Cap., ed. Schultes, 265 ; Sonder l.c. 510 (excl. var. *glabrata*) ; *Rh. incanum* Mill. Dict. ed. 8 n. 8, 1760 ; *Rh. tomentosum* Mill. (non Linn.) Pluk. Phyt. t. 219, fig. 7 (a form with coarsely crenate leaflets).

Leaflets, etc., retaining their heavy indument. Terminal leaflets subovate acuminate or obtuse, mucronate, narrowed from about the middle to a cuneate base. Lateral leaflets generally oblong, obtuse or subacute, mucronate with a cuneate base.

Herb. Linnaeus, London ; Herb. Thunberg, Upsala and various other old collections [e.g. Plukenet's in Sloane collection, British Museum, types of *Rh. incanum* Mill. and *Rh. tomentosum* Mill. (non L.)] ; Signal Hill, Capetown, 1,000 feet, Marloth 9470*b* ; Uitvlugt, Cape, sandy soil, very rare, grown flat about 2 feet, Muller (5117) ; Klipfontein, Zwartland E. & Z. 1099 (in S.A. Mus.) ; side of Lion's Head and Table Mountain E. et Z. 1098.

The following specimens belonging to E. *villosa* were noted by me in the Berlin Herbarium, Dahlem :—

1. ex Herb. Alex Braun, *Rh. aequalis* Pers. " non DC. fraglich mit *Rh. villosum* vereinigt " h.B. 58.

2. Hort. Bot. Benth. *Rh. pubescens* β *caledonica* (subglabrous forms ex hort. Bot. Berol. 1843 bear the same name).

3. Herb. Gundelsheimer (beginning of eighteenth century) " Rh. Africana trifolia tomentosa ".

4. " Rh. trifolium Africanum " (probably also Gundelsheimer coll.).

5. *Hort. Monac.* ? a narrow leaved form. (One old leaf is subglabrous and shows the typical venation of " mucronata ".)

Various other cultivated specimens, some of which are called *Rh. atomaria* Jacq.

Drège 5572 (*Rh. villosa* L., *Rh. atomaria* Jacq.), showing stages leading to typical *Rh. mucronata* ; Bergius 24, Oct. 15, mostly with smaller leaves than usual.

Hybrids: It has already been stated that the question whether the forms placed here under *Rh. mucronata* represent a series of hybrids must for the present be left undecided. Apparent hybrids with other species are very rare.

Rh. mucronata X *MacOwani* ?, Pappe (?), Caledon, Nov. (in Herb. S.A. Mus.). Flowers as in *Rh. mucronata*. Inflorescence as in *Rh. MacOwani*. Young branches, inflorescences, upper side of leaflets and veins on lower side pilose.

Rh. mucronata X *puberula* ?, Z. 2236, Cape Recief (in Herb. Kew.).

See also *Rh. Legati* Schonl.

Rh. mucronata Thunb., E. *villosa*. Marloth 9470*b*. Upper side.

Rh. mucronata Thunb., E. *villosa*. Marloth 9470*b*. Under side.

2. **Rhus Ernesti** Schonl. nov. sp.

Rh. incana var. *Galpinii* Burtt-Davy Ms.

Description: Frutex vix 1 m. altus ramulis teretibus villosissimis. Folia petiolata, petiolis villosissimis subteretibus supra leviter canaliculatis; foliola oblonga vel subovata apice obtusa vel subacuta saepius breviter mucronata, basi cuneata: margine subplana integra: utrinque sericeo-villosissima costa venisque pilis patentibus tectis; costa venisque utrinque leviter prominulis. Paniculae laterales foliis breviores, terminales longiores, parce ramosa, floribus sessilibus (♀ ignotis). Calycis lobi inaequales lanceolati extus tomentosi. Petala oblonga glabra. Drupa ignota.

Length of petioles about 2 cm.; terminal leaflets up to 4·5 cm.; lateral leaflets one-half to two-thirds of terminal leaflets.

Breadth of terminal leaflets up to 2·5 cm.; lateral leaflets one-half to two-thirds of terminal leaflets.

Floral bracts slightly exceeding 1 mm.

Length of calyx lobes 1–1¼ mm.; petals 1½–1¾ mm.

Distribution: Only known from the neighbourhood of Barberton.

Saddleback Mountain, near Barberton, 4.000 feet, Galpin 1016; Barberton, Thorncroft 27777 (in Herb. Transv. Mus.).

This has at first sight the look of typical *Rh. mucronata*, E. *villosa*, but the inflorescences and floral structure are different. The patent hairs on the midrib and lateral veins (more lightly coloured than the other hairs on the leaves) are also not found in *Rh. mucronata*. It is a pity there are no fruits known.

Rh. Ernesti Schonl. Galpin 2777. Under side.

Perhaps some specimens collected by Rademacher (Trans. Mus. 7270) at Carolina, Transvaal, must be placed here. The shoots collected seem to be dwarfed for some reason and both flowers and leaves are smaller than in typical *Rh. Ernesti*. The terminal leaflets do not exceed 1 cm. in length ; the petioles are about 5 mm. long.

3. **Rh. MacOwani** Schonl. nom. nov.

Rh. pubescens E. et Z. (non Thunb. ?) in Enum. 1100.

Rh. pyroides Sond. p. pte. (non Burch.) in Fl. Cap. II, 511, Engler, l.c. 430, and Diels, l.c. 582, 594, 628 ; *Rh. villosa* auct. plur. (non L.f.).

I take as types the specimens distributed by Ecklon and Zeyher under No. 1100. Whether they were right in naming them *Rh. pubescens* Thunb. must remain undecided as there is no original of Thunberg's species preserved, and the description in his Fl. Cap., ed. Schultes, 264, is not detailed enough. It is quite distinct from *Rh. pyroides* Burch., though I must admit that isolated branches from these two species are sometimes difficult to distinguish. Generally speaking, *Rh. MacOwani* is not so strikingly divaricately branched than *Rh. pyroides*, its petioles are relatively shorter and thicker, its panicles are larger and denser, its flowers are slightly smaller, its pubescence is generally not so appressed and silky, and is more apt to be more or less shed on older leaves. It has much smaller flowers, smaller and compressed drupes, and different inflorescence as compared with *Rh. mucronata*, E. *villosa*, which it sometimes resembles in its leaves.

The new name was given in memory of the late Dr. P. MacOwan.

Description : A shrub or small tree, sometimes reaching a height of over 30 feet ; branchlets terete, softly villous. Leaves petiolate, petioles subterete slightly furrowed above, at first villous, later often glabrescent. Leaflets at first pubescent or villous, later often glabrescent, ovate or obovate-cuneate, obtuse, acute or somewhat acuminate,

sometimes minutely mucronulate; margin not or very slightly revolute, entire or occasionally sparingly crenate or dentate; midrib and the arcuate, slightly branched, lateral veins slightly prominent on the upper surface, more so on the lower, tertiary veins reticulate (especially distinct on the upper surface when the hairs have more or less disappeared). Panicles pubescent, much branched and multiflowered, axillary about as long or longer than the leaves, terminal much longer than the leaves; bracts small, lanceolate, acute, pubescent. Flowers shortly pedicellate; calyx lobes ovate, pubescent, nearly half the length of the oblong petals. Drupe somewhat juicy, subglobose, slightly compressed, cream-coloured or with a tinge of red.

Length of petioles about 1·5 cm.; terminal leaflets 2·5–3·5 cm. (rarely up to 5 cm.); lateral leaflets about two-thirds of terminal leaflets.

Breadth of terminal leaflets 1·5–2 cm. (rarely up to 3 cm.); lateral leaflets about two-thirds of terminal leaflets.

Length of calyx lobes ½ mm.; petals 1–1¼ mm. Greatest diameter of drupe 3 mm.

Rh. MacOwani Schonl. E. and Z. 1002 (1100). Upper side.

Rh. MacOwani Schonl. E. and Z. 1100. Under side.

Distribution: In the coast districts from near Bains Kloof to Swaziland and the Transvaal, perhaps also in Tropical Africa (often placed under *Rh. villosa*, but the specimens placed under this species in various large European herbaria are a curious mixture of species and frequently incomplete). It is found in open scrub and in stream-bank bush from near sea-level to an altitude of at least 3,000 feet. Sometimes, especially along streams, it develops into a much branched tree which, e.g. at Keiskama Hoek and near Riebeek East, reach a height of over 30 feet. It flowers from December to April.

Occasionally leaves with four or five leaflets are found. Usually coppice shoots do not exhibit any unusual features, but all found on one stump of a tree on the farm Aylesby, near Riebeek East, had leaves with five leaflets. The petioles had a broad shallow channel above and were slightly winged, the branchlets and petioles were pubescent, the leaflets almost glabrous.

On the banks of the Zwartkops River and in the woods of Krakakamma, E. and Z. 1100, E. 1002; Burchell 949, 3001, 3044, 4888 in Herb. Kew; Drège 6800, also specimens by Drège distributed as *Rh. villosa* var. *subdentata b* and *Rh. villosa a* in Herb. Kew; Dal Josaphat, 600 feet, Tyson 898; Swellendam, in woods, Pappe 15; Zuurbraak, c. 800 feet, Schlechter 2127; mountains near Prince Alfred, 1,700 feet, Schlechter 9979 (very close to the form which Engler described from the Transvaal as *Rh. Rehmanniana*); Vet Rivier, Riversdale Division, 400 feet, Muir 3471 (terminal leaflet up to 7·5 cm. long); neighbourhood of Knysna from near sea-level to about 700 feet, in some of these the villosity is retained [as e.g. also in Schlechter 2127 and Pappe 15], on the under side of the adult leaflet, Duthie 13, 571*a*, Cloete 5128, Williamson 36, Schonland 4150, 3496, 3524; edge of indigenous forest, Blaauwkrantz, 5013, 5026; Haarlem, near railway bridge, 2,700 feet, Fourcade 3161; Assegai Bush, Humansdorp division, Fourcade 1145, Zahn 5051, Britten 1343, Schonland 3632; Kleinfontein, near Hankey, J. Sim 182; Van Stadens, and Kamaehs, near Uitenhage, Paterson 523; Port Elizabeth, Kemsley 260; Zuurberg, Holland 119; neighbourhood of

Grahamstown up to about 2,000 feet, Britten 1523, Dyer 45, 209 (many leaflets crenate or crenate-dentate near apex), Schonland 4414 (many leaflets as in Dyer 209, some leaves have four, others five leaflets), MacOwan 505/1218 (leaflets more elongated than usual and relatively narrower); Blaauwkrantz drift, Britten 1406 (leaves very much as in Muir 3471), 2736; Lushington valley, near road to Bathurst, Schonland 5168; Debe Nek, Rogers 4461; Katberg, Staples 5018; Keiskama Hoek, near the village; Komgha, 2,000 feet, Flanagan 798; Umzimkulu River, near Clydesdale, 15008, Tyson 2870; Umtata, 3,500 feet, Schlechter 6359; Ntsubane, Lusikisiki, Fraser 73/20/A (5099), 73/40/B (5164), 5098, Infengo Forest, Lusikisiki district, Fegen (5162), Pondoland, Bachmann 819; Friedenau, Natal, Rudatis 112, 1624; Hlatikulu, Swaziland, Stewart 2555 and 9538 (of the Herb. Transvaal Mus.).

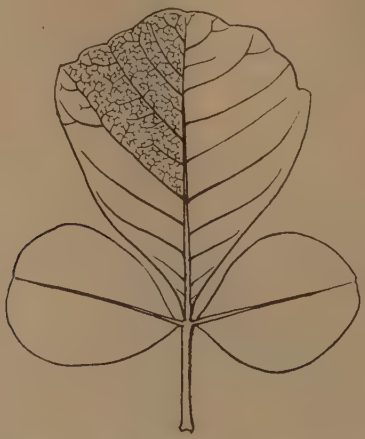
In Herb. Alb. Mus. there is a specimen from Oudtshoorn (Britten 34), unfortunately rather poor, which seems to belong here. It is glabrescent. The flowers appear to be *perfectly hermaphrodite*, a rather unusual occurrence.

Some Transvaal specimens, which I have seen, may belong here, but fuller material is required to make quite sure.

forma *Rehmanniana*.

Rh. Rehmanniana Engl. l.c. 422, Diels l. 578, 613.

Leaflets obovate or obovate truncate, the terminal one more or less narrowed at the base, entire in the lower part, crenate or crenate-dentate in the upper.



Rh. MacOwani Schonl., *forma Rehmanniana*. Rehmann 5560. Upper side.

Specimens which can be placed under this form are especially found in Natal and the Transvaal, but can be fairly closely matched with others found right to near the western limit of the species, e.g. Schlechter 1977. The amount of hairiness on the adult leaves varies as in typical forms.

Houtbosch, Transvaal, 5560, 5561; Barberton, Thorncroft 4532; Berlin forest reserve, on edge of great escarpment, c. 4,500 feet, Keet (5166); Middelkop plantation, near Tzaneen, common, usually in moist localities, Evans (5129); Colenso, Schlechter 6892; Friedenau, Natal, c. 500 feet, Rudatis 331 in Herb. Kew.

4. **Rh. Fraseri** Schonl. nom. nov.

Rh. tridentata Sond. in Fl. Cap. I, 511; Engler, l.c. 425; Diels, l.c. 580, 623 (non *Rh. tridentatum* Thunb. in Fl. Cap. ed. Schultes 222); *Rh. hirta* Harv. Ms. in Herb. Kew.

Named after Forester G. Fraser, Ntsubane, Lusikisiki, to whom I owe a great deal of material of *Rhus*, and whose No. 73/23/A (5143) agrees well with Gueinzius 390 from Natal in Herb. Kew, the type of *Rh. tridentata* Sond.

Description: Shrub with elongated, terete, tomentose, densely leafy branchlets. Leaves petiolate, petioles $\frac{1}{4}$–$\frac{1}{3}$ the length of the terminal leaflets (rarely somewhat longer), tomentose or pilose, deeply furrowed above. Leaflets pubescent, dark green and often glabrescent above, greyish green, pubescent below, more or less oblong, the terminal one becoming cuneate towards the base from above the middle or lower; margin slightly revolute, entire or with a few mucronulate gross teeth near the apex (often the terminal ones toothed, the lateral ones entire or all entire); midrib and lateral veins slightly prominent above, more so on the under side, tertiary veins reticulate (but indistinct even on glabrescent surfaces). Panicles tomentose from the axils of the upper leaves and (about equalling them in length) and terminal (longer than the leaves), much branched and multiflowered, bracts small, subulate; flowers pedicelled. Calyx segments pilose, especially along midrib, ovate $\frac{1}{3}$–$\frac{1}{2}$ of the oblong petals. Drupe subglobose, brownish, shining.

Length of petioles 1–2 cm.; terminal leaflets about 7 cm.; lateral leaflets 4–5 cm.
Breadth of terminal leaflets 2–3 cm.; lateral leaflets 1·5–2 cm.
Length of pedicels 1–1·5 mm.; calyx segments $\frac{1}{2}$–$\frac{3}{4}$ mm.; petals $1\frac{1}{4}$–$1\frac{1}{2}$ mm.
Diameter of drupe c. 4·5 mm., height 5·5–6 mm.

Rh. Fraseri Schonl. Gueinzius 390. Upper side.

Rh. Fraseri Schonl. Fraser (5149). Under side (woolly hairs hiding tertiary veins).

Distribution: Natal, Pondoland, and on the Amatola mountains. Engler has distinguished a variety *integrifolia*, which, however, I must drop as the occurence of teeth is never constant.

Natal, Gueinzius 390; Weza forest reserve, Harding, c. 4,000 feet, A.D.F.O. (5054, 5043); Pinetown and Inanda, Wood 852; Verulam, Wood 3908; Dumisa, Alexandra county, 600 m., Rudatis 801; Ntsubane, near Lusikisiki, Fraser 73/22/a (5143); Hogsback, grassy valleys, Rattray 291. Fraser (5149), from Ntsubane, is without flowers and has much broader leaves than the type. I think it is a coppice shoot.

5. **Rh. intermedia** Schonl. n. sp.

Allied to *Rh. Fraseri* Schonl. and extreme forms resembling *Rh. Legati* Schonl. (*Rh. laevigata* Thunb. non Linn.), but the pubescent branchlets, petioles, etc., distinguish it easily.

Description : Frutex 3–5 m. altus ramulis gracilibus teretibus griseo-vel fusco-villosis. Folia petiolata petiolis gracilibus primum villosis deinde sparse pilosis subteretibus interdum supra leviter canaliculatis. Foliola membranacea oblonga apice acuta vel acuminata mucronulata vel plicato-mucronulata basi saepius cuneata (terminalia saepius basi valde angustata vel petiolulata) ; margine leviter revoluta vel plana integra vel rarius apicem versus paucidentata ; juvenilia utrinque villosa, adulta utrinque pilosa vel glabrescentia ; costis et venis lateralibus utrinque leviter prominulis, nervis reticulatis non prominulis. Paniculae villosae multiramosae axillares foliolis subaequilongae, terminales foliis longiores bracteis subulatis floribus parvis pedicellatis. Calyxis lobi ovati acuti. Petala oblonga. Drupa subglobosa compressa.

Length of petioles 2·3–4 cm. ; terminal leaflets 7–10 cm. ; lateral leaflets about 3 cm.
Breadth of terminal leaflets 5–6·5 cm. ; lateral leaflets 2–2·3 c.m.
Length of calyx lobes barely ½ mm. ; petals barely 1¼ mm.
Greatest diameter of fruit about 3 mm. (similar to drupe of *Rh. MacOwani* Schonl.).

Rh. intermedia Schonl. Tustin (5122). Upper side.

Distribution : On the edge of forests from Natal to the northern Transvaal.

Those in search of natural hybrids might look upon this " species " as a hybrid between *Rh. MacOwani* and *Rh. Legati*. Against this view is the fact that it does not occur west of Natal, where these two species are commonly found close together.

Ngomi forest reserve, P.O. Hlobane, Natal, Tusten (5122); Diepkloof, Zoutpansberg, Burtt-Davy 5174; Halic forest station, Zoutpansberg, 4,200 feet, (5024); Woodbush plantation, P.O. Haenertsburg, common, c. 4,000 feet, Coilett (5077); De Hoek, Tzaneen, Pretorius (5086); ? Graskop, Evans (5109).

6. **Rh. pyroides** Burch. Trav. I, 340 (1822), Cat. Geogr. 1796.

Rh. sericophylla Schlecht. in Engler Pflanzenwelt Afrikas III, 2.
Rh. flexuosa Diels in Engl. Bot. Jahrb. XL, 86 (1907).

(For further synonyms see below.)

This species was found by Burchell on the Asbestos mountains. The type is preserved at Kew. He described it as follows: " Frutex 6-10 pedalis. Ramuli saepe spinescentes. Folia ovato-lanceolata integerrima glabra. Racemi axillares folio breviores; terminales longiores ". By comparison with De Candolle's description in Prodr. II (1825) 70, it will be seen that DC. seems to have described a different plant (foliolis obovatis-oblongis mucronatis, etc.), and the error has been perpetuated by subsequent authors. At all events both Sonder (l.c. 1, 511) and Engler (l.c. 430) took it to be the species which Ecklon and Zeyher distributed as *Rh. pubescens* Thunb. and which I have named *Rh. MacOwani*.

Description: The following notes were taken from Burchell No. 1796 at Kew:— A shrub (or scrambler) with very stout thorns, which are straight or curved and are 3–3·5 cm. long. Bark of older branches grey with numerous raised lenticels. Branchlets slender, 12–15 cm. long, terete, slightly puberulous. Leaves petiolate, petioles slender, 1·7–3 cm. in length, not exceeding half the length of the terminal leaflet, slightly furrowed above, puberulous. Leaflets submembranous, oblong-cuneate, usually acute, often shortly mucronulate; margin entire or with one or two teeth, upper surface subglabrous, lower slightly puberulous, subpilose on midrib and veins; venation reticulate, sometimes very distinct on both sides, but often tertiary veins hardly visible on upper side and indistinct on lower. Terminal leaflets 4–7 cm. long, 1·7–2·5 cm. broad. Lateral leaflets variable in size, often about $\frac{2}{3}$ the length of the terminal, often the two belonging to one leaf slightly different in size and shape. Panicles lax, puberulous, shorter than the leaves, lateral and terminal on the young branches. Flowers on short pedicels. Drupe subglobose, evidently slightly compressed, about 3 mm. in diameter.

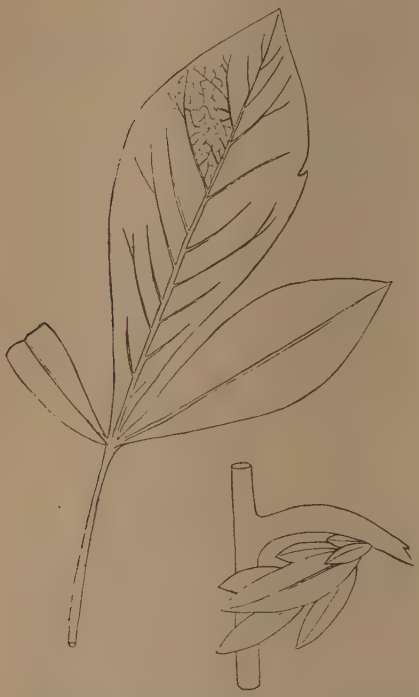
The following agree closely with the type (except that sometimes the pubescence is more prominent): Karreefontein, Griqualand West, March 21, Wilman; Papkuil, Wilman, February 1921: Newlands, Griqualand West, December 20, Wilman.

From these specimens the following description was drawn up:—

Frutex squarrosus saepius spinosus ramulis patentibus pubescentibus: foliis petiolatis, petiolis gracilibus teretibus pubescentibus foliolis brevioribus, foliolis membranaceis glaucis utrinque adpresse pubescentibus vel adultis interdum subglabris ovato-lanceolatis basi cuneatis vel rarius petiolulatis apice acutis vel subacutis rarius emarginatis saepius submucronatis margine integris rarius irregulariter crenatis subrevolutis, lateralibus et terminalibus subaequalibus vel lateralibus brevioribus costa atque nervis utrinque prominentibus venis reticulatis utrinque prominentibus; paniculis pubescentibus laxis, lateralibus et terminalibus, bracteis anguste lanceolatis acutis; floribus pedicellatis, calycis segmentis triangularibus, petalis pallide luteis late oblongis subduplo longioribus, disco (in floribus masculis) 5– (vel sub 10–) crenato; drupa subglobosa compressa.

Petioles 1·2–2 cm. long (rarely shorter or longer, but rarely half the length of the terminal leaflet). Leaflets 3 cm. long (average size; the relative length of terminal and lateral ones varies greatly). Panicle 2½–4 cm. long (rarely longer). Floral bracts about 1 mm. long. Pedicels 3–4 mm. long. Calyx segments ½–¾ mm. long. Petals 1¼–1½ mm. long. Drupe 3½–4 mm. in diameter.

All these may be united as var. A. *typica*, and the following specimens may also be referred to this form :—



Rh. pyroides Burch., A. *typica*. Burchell 1796.
Upper side. A thorny branch of the same.

Rh. pyroides Burch. A. *typica*. Wilman 1256.
Upper side.

Bloemfontein, Potts 3221 (fl. Nov.), Potts 1672 (young fr., Dec.), Potts 2052 (fl. Nov.), Potts 1337 (spreading bush 20 feet high by 20 feet wide), Potts 1220 (fl. Nov., spreading bush, sometimes a tree); Krom River, Karroo, Potts 1336; Trompsburg, Potts 3302, 3305, 3306 (fr. Jan.); Vereeniging, Jan., Burtt-Davy 15139; Kaffraria ? Cooper 538 in Herb. Kew; Cradock district, Cooper 510 in Herb. Kew.

There is a form very common, especially in the Transvaal, with larger, sometimes flexuous inflorescences, which, moreover, when young, have the flowers arranged in glomerules. This may be called var. C. *transvaalensis* (usually named *Rh. villosa* L.f. in numerous herbaria or *Rh. villosa* L.f. var. *gracilis* Engl.); *Rh. flexuosa* Diels and *Rh. sericophylla* Schlecht. may be referred to this form.

Harrismith, Sankey 246; Johannesburg, Gilfillan 6201 and 6202 in Herb. Galpin; Magaliesberg, Burke in Herb. Kew (erroneously marked " Fish River "), Z. 342; Aapies River, 4,800 feet, Schlechter 3609; Pretoria, Burtt-Davy, Rehmann 4740, 4742, Wilms 242, Leendertz 34 and 508, Reck 1089, Thomson 6663; Howlett 1; Naboomspruit, Galpin M 63; Warmbaths, Burtt-Davy 5093; Lydenburg district, Wilms 238; Rustenburg, Nation 197; Crocodile River, Schlechter 3982; Marico district and Schweizer Reneke, Holub in Herb. Kew; Bowker's Park, 10 miles west of Queenstown, 3,500 feet, Hilner 324; Lesseyton drift, Queenstown, Galpin 2574; Berry Reservoir, Queenstown, Hilner 344; Ugie, Surat, 4,300–4,500 feet, Britten 4691; Katberg, Staples 5018; Ntsubane, Lusikisiki; Mont aux Sources, Tugela Valley, 5,000 feet, Bayer and MacClean 33.

Pott 4934, from Mavieristad, was named by Burtt-Davy *Rh. incana* var. *sericea*. It belongs to *Rh. pyroides*, but requires further examination.

This form is evidently widely spread along the Drakensbergen into Swaziland, but I am afraid of quoting further numbers without re-examination. When, as frequently happens, the terminal inflorescence is large and densely multiflowered it cannot be easily distinguished from *Rh. MacOwani* except that this is more or less incano-pubescent, whereas the pubescence in *Rh. pyroides* is appressed sericeous and in the later the petioles are more slender than in *Rh. MacOwani*.

Rh. pyroides Burch., B. *transvaalensis*. Leendertz 34. Under side.

Forms which must be referred to *Rh. pyroides* Burch. are also common in Tropical Africa and are usually called *Rh. villosa* L.f.

C. *puberula*—*Rh. puberula* E. et Z. in enum. 1104, Sonder l.c. 511, Engler l.c. 427, Diels l.c. 587 (excluding var. *fastigiata* Sond. l.c. 512); *Rh. sericea* E. et Z. in enum. 1105; *Rh. Meyeriana* Presl Bem.

In the Berlin Herbarium specimens belonging to the true *Rh. pyroides* Burch. are placed by Engler under *Rh. puberula* E. et Z. without having been recognized as belonging to Burchell's species. As I agree that these two species belong together the name *Rh. puberula* must be dropped since Burchell's name is the older. The chief difference is mainly in size of petiole and leaflets; the former is generally 5–8 mm. long, the terminal leaflets 1·5–2 cm. long, 8–10 mm. broad, the lateral about two-thirds the size of the terminal The frequently oblique plicate apiculus of the leaflets seems to be a fairly characteristic feature of this form.

Distribution: Eastern Cape Province, Natal, Orange Free State, Transvaal. In open bush, locally common, rarely exceeding 7 feet in height, flowering generally from January to March.

Rh. pyroides Burch., C. *puberula*. MacOwan 862. Under side.

Rh. pyroides Burch., C. *puberula*. Zoutpansberg (5005). Under side.

Burchell 4744, 4874; Drège 6808A (*Rh. Meyeriana* Presl); Albany, Zeyher 888 (leaflets broader than usual); Geelhoutboom River, Humansdorp division, Fourcade 2123; Assegaibush (Albany), E. et Z. 1105 (type of *Rh. sericea* E. et Z.); south side of mountain drive, Grahamstown, R. Schonland; ib., MacOwan 766; Katberg, MacOwan 862, Staples (5018), (5022); Fort Fordyce, Hoesslin (5123); Hogsback? (5022); Wolfridge, near Keiskamma Hoek, Hunter (5086*b*); mountain sides near Silo, E. et Z. 1104 (type of *Rh. puberula* E. et Z.); near Queenstown, Hilner 324, 344, Galpin 2574; Komgha, Flanagan 800, Schlechter 6164; between Umtata and the Umzimvubu, Drège (5575 distributed as *Rh. angustifolia* L. *a*), Drège 5574, 5576; Pondoland, Bachmaan 821, 823, 825; Murchison, Wood 3126; Natal, Gerrard 1879; Government plantation, Harrismith (5139); Dunelm Farm, Fouriesburg, Potts 3310, 3311; Barberton, Thorncroft in Herb. Trans. Mus. 4495; Klaserie siding, Lydenburg, Keet 5160.

7. **Rh. Baurii** Schonl. n. sp. (*Rh. pyroides* Burch. var. *glabrata* Sond. in Fl. Cap. II, 511).

Closely allied to *Rh. pyroides* Burch. Sonder characterizes his variety as follows: "Branches and leaves subglabrous or glabrous, panicles pubescent". As he mixed up *Rh. pyroides* with the species called *Rh. pubescens* Thunb. by Ecklon and Zeyher, quite distinct plants may be placed under this variety. In addition to the characters mentioned the plants placed by me under *Rh. Baurii* have the following distinguishing characters:— Leaflets thinner than in *Rh. pyroides*. Petioles very slender, more than half the length of the terminal leaflet, sometimes almost equalling it. The terminal leaflet is very frequently subpetiolate, as it is usually very much narrowed at the base, but this also occurs in *Rh. pyroides*, though more rarely.

Description: Frutex inermis laxe ramosus ramulis gracilibus subteretibus subglabris vel pubescentibus. Folia petiolata, petiolis gracilibus, supra leviter canaliculatis. Foliola membranacea oblonga acuta, terminalia saepius valde attenuata, juvenilia adpresso-pubescentia deinde subglabra (costa venisque exceptis), ad margines integra vel paucidentata, reticulata costa utrinque prominenti, nervis lateralibus arcuatis utrinque leviter prominentibus, venis supra leviter prominentibus subtus immersis. Paniculae ex axillis foliorum

superiorum laterales foliis subaequales et terminales quam folia longiores, adpresso-pubescentes laxe ramosae, bracteis parvis, floribus pedicellatis. Calyx extus adpresso-pubescens lobis triangularibus subacutis. Petala oblonga. Drupa (Galpin 2340) subglobosa leviter compressa.

Length of petiole usually about two-thirds the length of the terminal leaflet.
Length of terminal leaflet usually about 6 cm., sometimes less.
Breadth of terminal leaflet usually about 2 cm.
Length of lateral leaflets two-thirds to five-sixths of the terminal leaflet; floral bracts about $\frac{1}{2}$ mm.; pedicels up to 2 mm.; calyx lobes $\frac{1}{2}$–$\frac{3}{4}$ mm.; petals $1\frac{1}{4}$–$1\frac{3}{4}$ mm.
Greatest diameter of drupe 3 mm.

Rh. Baurii Schonl. Baur 856. Under side.

Distribution: Midlands of Cape Province at an altitude of 2,500-4,000 feet.

Graaff-Reinet, by margin of watercourses, 2,500 feet, Oct., Bolus 134; Murraysburg, along watercourses and in open veld, 4,000 feet, Sept., Tyson 61; Sheldon, Nov., Rogers 151; Shiloh, 3,500 feet, Dec., Baur 856; near Queenstown, Jan., Hilner 336 (fairly common at the Berry Reservoir), Galpin 2200 (north-western mountain, waterside), Galpin 2201 (north-western mountain, rocky ridges; leaves much smaller than usual), Galpin 2340 (kopje Du Plessis farm, Klaas Smits R.; some leaves are 3 cm. wide and more or less crenato-dentate).

8. **Rhus nebulosa** Schonl. n. sp.

Description: Frutex laxe ramosus interdum spinosus ramulis subteretibus glabris vel parce pilosis; foliis petiolatis, petiolis quam foliola brevioribus pilosis, supra apicem versus canaliculatis vix alatis; foliolis subcoriaceis supra viridibus subtus pallidioribus utrinque sparse pilosis vel glabrescentibus ovatis basi cuneatis vel angustatis, margine integris leviter revolutis, apice obtusis vel acutis vel mucronatis, costa, nervis atque venis reticulatis utrinque prominentibus, paniculis parce pilosis quam folia longioribus laxe ramosis, ramis gracilibus ultimis brevibus, axillaribus et terminalibus, bracteis brevissimis subulatis; floribus pedicellatis pentameris vel hexameris, calycis segmentis brevissimis ovatis margine pilosis, petalis oblongis pallide luteis, disco in floribus masculis 5- (vel 6-) crenato; drupa parva subglobosa compressa rubescens, mesocarpo succulento.

Height of plant rarely up to 6 feet, often scrambling. Petiole 1·2–2·5 cm. long.
Terminal leaflets usually 3½ cm. long (sometimes up to 5·4 cm.); average breadth about 2·2 cm.
Lateral leaflets usually about one-third shorter.
Lateral panicles up to 8·5 cm. long; terminal up to 17 cm. long. Floral bracts ½–¾ mm. long.
Pedicels ¾–1½ mm. long. Sepals about ½ mm. long. Petals about 1¼ mm. long.
Drupe 3–3½ mm. in greatest diameter and about as high.

Rh. nebulosa Schonl. Galpin 2853. Upper side.

Distribution: Sandhills and coast bush from Port St. Johns to Durban at low altitudes, rarely up to 150 feet; also at Inanda.

Port St. Johns, Ap. (fl.), Galpin 2853, Miss Wood 48, 74, Schonland 4049, 4099; Embotye, near Pondoland coast, Fraser (5106); near Durban, Sutherland 22, Schlechter 2858 (fr.), Drége in Herb. Kew (named *Rh. pyroides* Burch. c.), Rudatis 1655; Inanda, Wood 905, 894; Natal, Gerrard 354, 529.

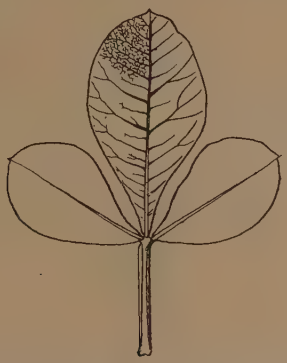
9. **Rh. krebsiana** Presl Bot. Bem. 41 (name only); Engler l.c. 409; Diels l.c. 573.

Description: A perfectly glabrous shrub (or, according to Engler, young branchlets minutely puberulous), with somewhat corrugated branches and angular branchlets more or less tinged with red. Leaves petiolate; petioles often attaining two-thirds the length of the terminal leaflets, somewhat angular, furrowed and often slightly winged above. Leaflets sessile, subcoriaceous, oblong or oblong-obovate, at the apex obtuse or slightly emarginate, often with a small mucro, at the base cuneate (the terminal one much narrowed, often subpetiolulate), the lateral somewhat asymmetrical; margin entire, slightly revolute; midrib and the much branched lateral veins slightly sunk on upper surface, prominent on lower surface, tertiary veins reticulate and distinct on both surfaces. Panicles lateral, lax, barely as long as the leaves; flowers pedicellate; bracts very minute, subulate. Calyx lobes oblong-triangular subacute. Petals oblong. Immature drupe subglobose.

Length of petioles 2–3 cm.; terminal leaflets 3–6 cm.; lateral leaflets 2–3·2 cm.
Breadth of terminal leaflets 1·5–2·5 cm.; lateral leaflets 1·5–2 cm.
Length of inflorescences 3–6 cm.; pedicels 1½–2 mm.
Length of calyx lobes 1 mm.
Length of petals 2 mm..... } teste Engler.

Distribution: The type is without locality, but the species has recently been re-discovered in Griqualand East.

Krebs in Herb berol.; Tyger Vley in fringing forest on a hillside stream. Mt. Currie distr., 4500, July (young fr.), O.B. Miller, D 312—Specimens with young flowers were collected in March.



Rh. krebsiana Licht. Krebs. Upper side.

10. Rhus dura Schonl. n. sp.

Description: Frutex ad 3–4 m. altus ramis subteretibus brunneis sparse pilosis, foliis petiolatis, petiolis foliolis brevioribus sparse tomentosis supra canaliculatis anguste alatis; foliolis glaberrimis coriaceis supra nitidis saturate viridibus subtus pallidioribus ovatis vel late oblongis vel obovatis basi angustatis vel cuneatis apice obtusis vel acutis breviter mucronatis vel rarius emarginatis, margine integris vel apicem versus leviter et irregulatiter crenatis vel dentatis vel profunde crenatis; costa, nervis et venis valde reticulatis utrinque prominentibus; paniculis sparse tomentosis ex axillis foliorum superiorum lateralibus et terminalibus foliis vix aequantibus, floribus ignotis. Drupae pedicellatae subglobosae nitidae.

Rh. dura Schonl. Evans (5070). Upper side.

Petiole 1·1–3 cm. long.
Terminal leaflet up to 6·5 cm. long; about 3 cm. broad.
Lateral leaflets generally half the length of the terminal leaflets.
Drupe 3–3½ mm. in diameter.

Distribution: Only known from Graskop, near Pilgrims Rest, Transvaal, at an altitude of 4,800 feet.

Forester Evans, who collected fruiting specimens in January (No. 5070 in Herb. Alb. Mus.), states that it is common and 10–12 feet high; further, that the fruit is edible and the wood tough. It is evidently closely allied to *Rh. krebsiana* and *Rh. MacOwani*, forma *Rehmanniana*, but it has more coriaceous leaves than either of them. As in the latter, the reticulate tertiary veins on both sides of the leaflets are very prominent. In many respects it resembles *Rh. polyneura* Engler et Gilg, in "Baum, Kunene—Zambesi Expedition," p. 289, but in this the flowers are arranged in dense fascicles separated by wide internodes, whereas in our specimens the flowers seemed to have been arranged fairly regularly in a lax raceme.

11. **Rhus Rudatisii** Engl. in "Pflanzenwelt Afrikas" III, 2, 217.

Description: Caulis efoliatus lignosus repens ramulis erectis aggregatis basin versus efoliatis pubescentibus sursum villosis dense foliosis subteretibus; folia petiolata villosa deinde pilosa, foliolis oblanceolatis vel anguste oblongis apice acuminatis vel mucronatis membranaceis costa et nervis lateralibus paucis adscendentibus parum ramosis utrinque parum prominentibus. Paniculae laxae pauciflorae laterales quam folia breviores et terminales foliis paullum superantes. Flores pedicellati bracteis subulatis calycis segmentis obtusis ovatis extus pilosis, petalis flavis subtriplo longioribus oblongis.

Branches up to 30 cm. long.
The lowest leaves are smaller than those in the middle of the branches and the size decreases upwards again.
In the middle of the branches the length of the terminal leaflet varies from 3½–4·8 cm.
The petiole may reach a length of 1·4 cm.
In one flowering branch the leaves are very much reduced in size.
Petals evidently about 2 mm. long.

Rh. Rudatisii Engl. Rudatis 698. Lower side.

Only known from one locality in Natal—Friedenau, Umgaye flats, Alexandra county, c. 600 m. Natal, Sep., grazed pastures, fl. yellow, Rudatis 698. Type in Herb. Berlin.

Judging by nervation of leaves and the inflorescence I would place this near *Rh. pyroides* Burch. var. *puberula*, but it is very distinct. When more material is available a transfer to another group, perhaps next to *Rh. fastigiata* may be desirable.

DENTATA group.

12. **Rh. dentata** Thunb. (Synonyms: see below.)

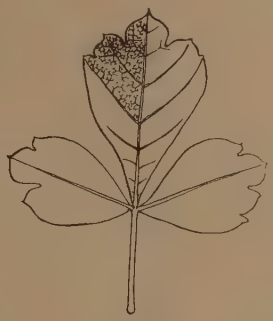
This is an extremely variable species and forms a curious parallel to *Rh. mucronata* Thunb., not only on account of its polymorphism but also because it includes quite glabrous, more or less pilose and villous forms.

The amount of hairiness here cannot be used as specific or varietal distinctions. I have used it to distinguish different forms. The form and size of the leaves again is very variable, but as these variations to a certain extent are geographically circumscribed (though this applies to a certain extent to the forms also) I have used them to form three varieties, but sharp distinctions between them cannot be given, though extreme forms are easily recognized.

The division of the species would then be:—

A. *typica*: *α genuina*, *β pilosa*; B. *parvifolia*: *α glabrescens*, *β pilosissima*; C. *grandifolia*: *α glabra*, *β pilosa*, *γ pilosissima*.

Then there are a number of forms which do not fit in with such a scheme of classification. In most cases they are intermediate between *Rh. dentata* and other well-known species, and there can be no reasonable doubt that they are hybrids.



Rh. dentata Thunb., A. *typica α genuina*. Fourcade 965. Under side.

Engler (l.c. 435) has separated *Rh. Sonderi* from *Rh. dentata*. It coincides to a large extent with C. *grandifolia*. The leaflets are, according to Engler, not albo-marginate. This, I find, is not always the case. This character is also variable in typical *dentata*. He further states that the petals are barely over 1 mm. long. I find them 1¼–1½ mm. long. In A. *typica* they vary in length from 1½–2 mm., so that it seems better to sink again *Rh. Sonderi* in *Rh. dentata*. I must also unite with it *Rh. parvifolia* Sond., *Rh. truncata* Schinz, *Rh. Galpinii* Schinz (non Engl.), and *Rh. acutidens* Engl.

Distribution: In the coast districts from the Humansdorp division to Natal, on the eastern mountains, and in the Transvaal.

A. *typica*—

Description: A perfectly glabrous or more or less pilose or villous shrub, unarmed or subspinous with short rigid or sometimes slender, slightly furrowed subterete branchlets. Leaves petiolate, petioles slender, ½–¾ the length of the terminal leaflets, narrowly canaliculate above. Leaflets thin, membranous, deep green above, lighter below, often subplicate, sessile, obovate, usually coarsely crenato-dentate in the upper part, rarely subentire or entire, teeth mucronate, the entire base of the leaflets cuneate; margin flat, sometimes white-margined; midrib slightly sunk above, somewhat prominent below, lateral veins immersed above and slightly prominent below, rarely also above, tertiary veins reticulate.

immersed. Panicles loose, the axillary generally shorter than the leaves, the terminal slightly longer, bracts subulate, small, pedicels longer than the flowers. Calyx lobes triangular, petals oblong. Drupe more or less red, shining, subglobose, slightly depressed.

Length of petioles about 1·5 cm.; terminal leaflets usually 2–2·5 cm.
Breadth of terminal leaflets usually about 1·7–2 cm.
Lateral leaflets one-half to two-thirds the size of the terminal leaflets.
Length of pedicels about 2 mm.; calyx lobes about ¾ mm.; petals 1½–2 mm.
Diameter of drupe about 4 mm.

α genuina—Perfectly glabrous. *Rh. dentata* Thunb. in Fl. Cap. ed. Schultes 265; *Rh. cuneifolia* E. Mey. in Drège exsicc.

Distribution: From the Storms River to Bothas Hill, near Grahamstown, and on the eastern mountains to Stutterheim.

Herb. Thunberg, Upsala; Storms River, 250 feet, Nov. (fl.), Schlechter 5984; Witte Els Bosch flats, 700 feet, Fourcade 2198; Oudebosch flats, Fourcade 965; Suku, Humansdorp division, Burchell 4819 (many leaves entire or subentire); Hofman's bush, Humansdorp division, thick scrub at foot of kloof, Britten 1175; Kleinfontein, near Hankey, common, J. Sim 159 (many leaflets acuminate and with very small teeth); Gamtoos River, Schlechter 6057; Van Stadens Mountains E. et Z. 1126, Ecklon 21; between Grahamstown and Assegai bush, Ecklon 368 (wrongly distributed as *Rh. tridactyla* Burch.); ib. Z., 2231; Bothas Hill, near Grahamstown, Dyer , MacOwan 281; Boschberg, near Somerset East, MacOwan 281 bis; Cambedoosberg, Drège ("Rh. dentata Thunb. b"), Bedford, Mansell Weale 870; Katberg, Staples (5020) [partly with longer petioles than the type]; Quaku forest station (4480); edge of Mkubiso forest, common, Stayner 37.

β pilosa.—Sparingly pilose on the branchlets, panicles, petioles and young leaflets (especially veins) and calyx, sometimes also on older leaflets.

Distribution: From Van Stadens to Umtata, also on the Amatola Range, Maclear district, Fouriesburg, Orange Free State, Barberton and Pilgrims Rest districts, Transvaal.

Amongst bushes on the Van Stadens Mountains, Z. 2231 bis; Grahamstown, 1,900 feet, Schlechter 2639: 3 miles north-west of Grahamstown, 4–5 feet high, 2,000 feet, Dyer 210 (one branch quite glabrous); Tarka River, Kabousie, Cooper 274; Hogsback, Rattray 236; Stutterheim, 3,000 feet, Hunter (5033), ib., Woodcock (5009); Komgha, 2,000 feet, Schlechter 6168; ib., Flanagan 656; slope towards the Umtata waterfall, scattered, not more than 4 feet high, Schonland 3835; Cala, Royffe 183; Surat, Maclear, Britten 4564; mountain sides, Fouriesburg, Orange Free State, 6,200 feet, Potts 1955 ("leaves deciduous"); Barberton and Pilgrims Rest districts, common, Keet 1455.

B. *parvifolia* (*Rh. parvifolia* Harv. in Fl. Cap. I, 510); *Rh. mollis* E. Mey. in Drège exsicc. = *Rh. truncata* Schinz in Bull. de l'herb. Boiss. Ser. II, viii, 86.

Leaflets smaller than in A. and generally not so deeply incised or even sometimes entire, sometimes distinctly truncate and slightly emarginate (*Rh. truncata* Schinz), terminal usually 10–15 mm. long, petiole usually slightly under 10 mm. long.

Distribution: Queenstown district to Natal and the Transvaal.

α glabrescens.—Leaflets glabrous or sparingly pilose.

Rocky places on the Insiswa Mountain, Griqualand East, 2,300 m., Schlechter 6465 (type of *Rh. truncata* Schinz); Colenso, 3,200 feet, Schlechter 6882; Moorddrift, Transvaal, Leendertz 2265; Umbombola Range, 4,000–4,400 feet, shrub 3 feet, Galpin 2190, and the following in Herb. Kew: Natal, 3,500–4,000 feet, Sutherland; Natal, Gerrard 1400; Umgeni waterfall, Cooper 2169.

β pilosissima.—Leaflets retaining a covering of soft longish hairs.

Fincham's Nek, Queenstown, Galpin 2204; hillside near junction of Kei Rivers, district Queenstown, 2,350 feet, shrub 3 feet high, Galpin 8099; Tabase, Transkei, 2,500 feet, Baur 333; Mvenyani, Cedarville, Griqualand East, Bandert 42; Ingungo, 3,000 feet, Schlechter 6311; Mooi River, 6,000 feet, Schlechter 3348 (Wood 1035 in Herb. Berol. and Kew, and Rehmann 4743 in Herb. Berol.).

C. *grandifolia*—

Description: Young axial structures and petioles softly shaggy pubescent, rarely glabrous. Leaflets generally retaining a covering of soft hairs, especially along midrib, lateral veins and margins, more rarely plant subglabrous or quite glabrous. The leaves

are generally two to three times the size of the average in A., but no sharp distinction can be drawn. With the increase in size of the leaves the petioles often become absolutely and relatively longer. The general outline of the leaflets, although variable, resembles A as a rule (*Rh. Sonderi* Engl.). There is, however, a tendency to form acute apices, and sometimes the leaflets are almost lanceolate (*Rh. Galpinii* Schinz, in Bull, de l'herb, Boiss Ser. II, VIII, 638 Galpin 646 from Barberton [non Engl.] = *Rh. dentata* var. *acuminata* Burtt-Davy Ms.).

Rh. dentata Thunb., C. *grandifolia*, γ *pilosissima*. Fraser (5039). Under side.

Distribution : Chiefly on the outside of forest and in swampy ground from eastern Cape Colony to Natal, the eastern Orange Free State to the northern Transvaal.

α *glabra*.—Quite glabrous.

Ntsubane, 10 miles from Lusikisiki, 5 miles from coast on Table Mountain sandstone, fairly common, 1,800 feet, Fraser (5048); Ingwangwane, P.O. Riverside (4484); Weza forest reserve, 14 miles from Harding, Sallender (5044), 5045 p. pte.; Ladybrand, Rogers 791; between Greytown and Newcastle, Wilms 1921; Alexandra county, Rudatis 1149.

β *pilosa*.—Pilose, leaflets glabrous or glabrescent (largely = *Rh. Sonderi* Engl. var. *pilosa* Engl., e.g. Schlechter 6990), and *Rh. dentata* β *puberula* Sond.

East London, Rattray 169; Kentani district, 1,200 feet, fragrant shrub, 1–5 feet, Pegler 900 p. pte.; Amanzamnyanu, Mt. Frere, 3,000 feet, common on hillside, Van der Merwe (5104); Dlokolyana forest, East Griqualand, 4,500 feet, average height 20 feet, common (5046, 5072); Insizwa, 6,000 feet, Schlechter 6525; Howick Falls, Rogers 546; Weza forest reserve, near Harding, c. 4,000 feet, Sallender (5045 p. pte.); Van Reenen, 5,600 feet, Schlechter 6990 (the specimens in Herb. Alb. Mus. are evidently coppice shoots with very large leaves, petioles up to 5·5 cm. long, terminal leaflets up to 8·5 cm. long); near Lydenburg, Burtt-Davy 7642, 5328; Graskop, northern Transvaal, Evans (5108*a*); ib., branch with juvenile foliage which is very large, similar to Schlechter 6990, Graskop, Evans (5095); Fouriesburg, Dunelm farm, on mountain side, shrub 3–5 feet, Potts 3106; scattered over the mountain, Ladybrand, Patterson (5136). There is a sterile branch in Herb. Alb. Mus. which agrees with many other specimens in Herb. Alb. Mus. and a fruiting branch in which the leaves do not differ much from A. *typica*, but the panicles are much longer (up to 7 cm.).

γ pilosissima.—Leaflets retaining largely a covering of soft longish hairs.

Congcane, 14 miles north-north-east of Qumbu, Transkei, Dwyer (5113); common in the neighbourhood of Lusikisiki, Pondoland, Fraser (5037, 5039); Ingwangwane, P.O. Riverside, (4482); Ladysmith, Natal, Rogers 694 (leaflets with a more obtuse outline than is generally the case); Pretoria, Rehmann 4743 (petioles very variable in length from over 1 cm. to 5·2 cm.); Ermelo, Tennant 6938; Elands spruitberg, 1,730 m., Schlechter 3390; Mavieristad, Pott 4933.

The separation of var. C. *grandifolia* into the forms here distinguished, being quite artificial and not adopted until my return from Europe, a few of the following in Herb. Kew may have to be readjusted. Some may even have to be placed under A; others are almost certainly hybrids.

β pilosa—

Zuurbergen, Drège (marked *Rh. crenata* Thunb. ?), cotype of *Rh. dentata β puberula* Sond. (young axial organs and petioles pilose, also midrib and margin of leaflets, otherwise surface of the latter sparsely pilose); Burchell 4171, 4607; Shiloh, 3800, Baur 894; Br. Caffraria, Cooper 275, 422 (this and the following very much like *Rh. Galpinii* Schinz); Natal, Gerrard 762; Inanda, Wood 1140; Phillips, Bethlehem 3158, 3161; The Downs, Pietersburg, Rogers 22039 (agrees closely with *Rh. acutidens* Engl.); Limpopo sources, Nelson 515 (like *Rh. Galpinii* Schinz.).

γ pilosissima—

Basutoland, Dieterlen 76 *a* and *b*, Cooper 2171; Orange Free State, Cooper 850; Hoogeveld, Page's Hotel, Transvaal, Rehmann 6863; Charlestown, Natal, Mogg 9655.

Hybrids: There can be no doubt that *Rh. dentata* hybridizes freely with *Rh. Legati*. Such evident hybrids can be readily detected by the practised eye in the field, but cannot always be detected with certainty in herbarium specimens, and no doubt some of the specimens enumerated above are hybrids, e.g. those referred to *Rh. Galpinii* Schinz and *Rh. acutidens* Engl. l.c. 423; Diels l.c. 578,623.

Rh. grandidens Harv. Gerrard 1399. (A hybrid ?)

Rh. acutidens Engl. Rehmann 5558. (A hybrid ?)

Rh. dentata Thunb. Schlechter 3642. Under side. (A hybrid ?)

A hybrid of *Rh. dentata* ? Woodcock 4471. Upper side.

Rh. dentata X *Legati*.—Common on the Katberg, Amatolas, and near Grahamstown: terminal leaflet often petiolulate, leaflets very irregularly dentate, axillary panicles much longer than the leaves, e.g. Dyer 746*a* and *b* (Katberg), Woodcock (5010), Kubusie, Stutterheim, Dyer 409 (Howiesons Poort).

Rh. dentata X *pyroides* var. *puberula* (an *fastigiata* ?).—Leaflets with a few acute teeth (usually only in the upper half), cuneate from near the apex to the base, petioles often under 1 cm. long, terminal leaflet 1·5–2 cm. long. A rambling shrub, about 8 feet high, under common yellowwood, fairly plentiful, Upper Kubusie, Stutterheim district, 3,300 feet, Woodcock (4471). The hybrid nature of this curious form (the leaves of which often resemble those of *Rh. acutidens*) may also be concluded from the fact that only sterile flowers with abortive stamens and no ovaries were found. In some flowers the calyx lobes were 1 mm. long, in others $1\frac{1}{4}$–$1\frac{1}{2}$ mm. Another specimen, which is like *Rh. acutidens* Engl., is Moss 8324, from Witpoortje Kloof, near Johannesburg. Prof. Moss noted on the label: "*Rh. dentata* X *pyroides* (me judice)." Here the anthers were fully developed. Another evident hybrid is *Rh. grandidens* Harv. Ms. in Herb. Kew; Engl. l.c. 440; Diels l.c. 587. It was described from Gerrard No. 1339 in Herb. Kew. It has glabrous leaflets which are narrowly lanceolate, very acute and usually [not always, as Engler stated] provided with a few acute teeth above the middle. Flowers and fruits are unknown. Rudatis 1310, from the Umgaye Flats, Alexandra county, in the Berlin Herb. is very similar. The following notes were taken from it:—A much branched small shrub, 3–6 feet high, with ascending densely leafy branches. The young branches, petioles and petals are pubescent. The leaflets are subglabrous and have revolute margins. The midrib is slightly sunk above, prominent below, the lateral veins often prominent above and usually prominent below, arising at rather an obtuse angle. The specimen has flowerbuds, which are rather large for the genus. They are arranged in dense lateral pyramidal panicles which are shorter than the leaves.

13. **Rh. carnosula** Schonl. n. sp.

Rh. laevigata L. β foliis latioribus grosse dentatis in Drège exsicc. 5569; *Rh. laevigata* Thunb. β *dentata* E. Mey.; Sonder l.c. 514.

Differs from *Rh. laevigata* Thunb. (non Linn.): Flowers larger; panicles always terminal and lateral in the axils of the upper leaves; styles frequently persisting even when the drupes are ripe; leaflets thicker, slightly fleshy, frequently coarsely dentate, lateral veins thicker and more prominent. Merges near Grahamstown into some forms of *Rh. dentata* in the shape and dentition of the leaflets. Probably also closely allied to *Rh. eckloniana*.

Description: Frutex glaberrimus 2–15′ altus ramulis gracilibus teretibus. Folia petiolata petiolis supra canaliculatis. Foliola carnosula subcoriacea, sessilia vel terminalia petiolulata, oblonga vel subovata basi cuneata apice acuta vel acuminata mucronata; margine plana saepius albocincta, parte superiori $\pm$ grosse dentata, dentibus oblique subcrenatis vel oblique triangularibus mucronatis vel integra; costa venisque supra vix prominulis infra costa valde prominenti venis prominulis, nervis utrinque vix prominulis. Paniculae multiflorae axillares quam folia breviores, terminales longiores, bracteis parvis anguste lanceolatis acutis, floribus pedicellatis. Calycis lobi subovati subacuti vel obtusi. Petala oblonga. Drupa nitida subglobosa stylis saepius persistentibus.

Length of petioles 2–3·5 cm.; terminal leaflets 5–7 cm.; lateral leaflets three-quarters to five-sixths of terminal leaflets.
Breadth of terminal leaflets usually 2 cm., sometimes nearly 3 cm.
Breadth of lateral leaflets slightly less than terminal leaflets.
Length of pedicels 1–2 mm.; calyx lobes about $\frac{3}{4}$ mm.; petals $1\frac{1}{2}$–2 mm.
Diameter of drupe about 5 mm.

Distribution: From Howiesons Poort, near Grahamstown (where, however, it is not quite typical), along the coast to Pondoland.

A. *typica*—

Gekau, Drège 5569; East London, Rattray 177 (= Bolus 8839 in Herb. Bol.); Keimouth, 1,000 feet, Schlechter 6212; amongst coarse valley vegetation, 2–3 feet, Feb. (young flowers and fruit), Kentani, 1,000 feet, Pegler 225; Eastgate S. Johns, Schonland 3944; Ntsubane forest station, Lusikisiki, Pondoland, Fraser (5080) [one branch with entire leaves]; ib., Fraser (5146) [one branch with small leaves, terminal leaflet not exceeding 4 cm. in length]; ib., Fraser (5152) [with ovate leaflets]; Notensila forest station, Pondoland (5038); Pondoland, Bachmann 69 in Herb. Berol.

Rh. carnosula Schonl. (5038). Under side.

B. *longipetiolata.*—Leaflets about the average size and shape of the typical form, but with much longer petioles (4–6 cm.).

East London, Rattray 170 (some leaves have a fourth, small leaflet); 8 miles east of East London, Dyer 1985 (not bushy, 2–4 feet high); Komgha, 2,111 feet, Rogers 3309; slope towards Umtata waterfall, shrub 15 feet high, scattered, Schonland 3836; Embotye, Pondoland, Fraser 73/16/B (5100*a*); Ntsubane, Fraser 5145, 5149.

C. *parvifolia.*—Leaflets smaller than in the type with slightly prominent whitish lateral veins on the upper surface.

Ntsubane and other places a few miles from the sea in Pondoland, Fraser (5053, open veld, sandy soil often swept by fire, height about 2 feet), (5151), (5081).

The specimens from Grahamstown referred to above, e.g. Dyer 196, have the lateral veins of the leaflets only very slightly prominent on the surface or they are quite immersed, the flowers are smaller (calyx lobes $\frac{1}{2}$–$\frac{3}{4}$ mm. long, petals $1\frac{1}{4}$ mm. long), fruits also smaller than in the type.

Hybrids: Perhaps the plants with very long petioles may be hybrids with *Rh. Legati* Schonl. (*Rh. laevigata* Thunb.). Hybridization with *Rh. dentata* Thunb. is also suspected.

14. **Rh. Rogersii** Schonl. n. sp.

Description: Frutex fastigiatus 3–4′ altus ramulis novellis subteretibus striatis pilosis. Folia petiolata petiolis striatis pilosis supra late canaliculatis subalatis. Foliola subcoriacea sessilia oblonga infra medium cuneata vel totius cuneata, juvenilia dense et breviter pubescentia, adulta glabrescentia vel glaberrima, supra saturate viridia subtus valde pallidiora; ad margines leviter revoluta, basi usque ad medium vel ultra integra, parte superiori ± grosse crenato-dentata dentibus mucronatis; costa venisque utrinque

prominulis nervis reticulatis immersis. Paniculae multiramosae multiflorae leviter pilosae vel glabrae laterales and terminales quam folia breviora vel longiora bracteis parvis lanceolatis, floribus breviter pedicellatis. Calycis lobi inaequales subovati subacuti vel obtusi. Petala oblonga. Drupa immatura subglobosa.

Length of petiole about 2·5 cm.
Length of terminal leaflets 8–10 cm. (generally); lateral leaflets 4–9 cm. (generally about 7·5).
Breadth of terminal leaflets about 3 cm.; lateral leaflets about 2 cm.
Length of pedicels 1–1¼ mm.; calyx lobes about ½ mm.; petals about 1¼ mm.

Rh. Rogersii Schonl. Rogers 18270. Upper side.

DISTRIBUTION: Barberton district and Swaziland.

Barberton, 3,000 feet, Dec. (fl.), Rogers 18270; "Hilltop", Barberton, in scrub forest on granite soil, Nov. (fl.), Keet 1454 ("a small bush, 3–4 feet high, common at this locality, and seen also along kranses at Berlin, in the same district, at elevations up to 5.000 feet"); Berlin forest reserve, on the edge of the great escarpment, Barberton division, c. 4,000 feet, Apr. (young fr.), Keet (5165); Godwan River, Swaziland, Feb. (fl.), Jenkins (Transvaal Mus. herb. 10370).

The female inflorescences are longer and looser than the male as far as is shown by the available material.

15. Rh. ntsubanensis Schonl. n. sp.

Description: Frutex parvus ramis juvenilibus subteretibus glabris lenticellis numerosis orbicularibus prominentibus tectis. Folia petiolata petiolis glabris vel subglabris supra canaliculatis subalatis. Foliola glabra sessilia oblongo-ovata basi cuneata apice acuta vel subacuta saepius plicato-mucronata, facie undulata, supra saturate viridia subtus glauca, margine integra; costa venisque supra vix prominulis, subtus conspicue prominentibus nervis paucis reticulatis immersis. Paniculae glabrae laxae valde ramosae. Flores ignoti. Drupa subglobosa nitida primum rubriuscula carnosa deinde subatra.

Length of petioles about 2 cm.; terminal leaflets 7–8 cm.; lateral leaflets 6–7 cm.
Breadth of terminal leaflets about 3 cm.; lateral leaflets about 2·7 cm.
Diameter of drupe 4–5 mm.

Rh. ntsubanensis Schonl. Fraser (5138). Under side.

Distribution: Only one specimen known—found at Ntsubane Forest station, near Lusikisiki, Pondoland, by Forester G. H. B. Fraser (No. 73/22/B; 5138 in Herb. Alb. Museum).

REFRACTA group.

16. **Rh. refracta** E. et Z. in Enum. 1103.

Description: A much branched, often thorny shrub, reaching a height of 8–9 feet, branchlets often nearly horizontal, subterete, grey or pale rufous villous. Leaves petiolate, petioles subterete, flattened or slightly furrowed above, leaflets rigidly membranous, dark green above, paler below, when young villous, later sparsely pilose on both surfaces, often corrugated, obovate-cuneate, obtuse or a little emarginate or mucronulate at the apex, margin slightly revolute, entire or rarely crenulate in the upper part, midrib and the few lateral veins usually sunk in the upper surface of the leaflets, slightly prominent on the lower, tertiary veins few and usually not visible in dried specimens. Panicles axillary and terminal, greyish villous, laxly branched, longer than the leaves. Bracts very minute. Sepals subovate, pilose on the outside. Petals oblong. Drupe somewhat fleshy, subglobose, slightly depressed above, blackish with a greyish bloom.

Length of petiole 7–10 mm.....
Length of terminal leaflets about 1·2–2·2 cm.
Length of lateral leaflets about 7–10 mm.....
Breadth of terminal leaflets about 1 cm.....
Breadth of lateral leaflets about 5–8 mm.....
} Somewhat larger in some forms growing near the sea.

Length of male panicle about 7 cm.; pedicels about 1 mm.
Length of calyx lobes about ½ mm.; petals about 1¼ mm.
Drupe: height about 3½ mm., breadth and depth about 4 mm.

Rh. refracta E. et Z. Dyer 211. Under side.

Distribution: In dry open scrub from the Knysna division to Natal (?) from near sea-level to an altitude of about 2,000 feet.

Blaauwkrantz forest reserve, Knysna division, 1 mile from sea, 200 feet, Zahn 5040; in the forests of Addo and by the Zwartkops River, E. and Z. 1103, Z. 14. 87; common in the neighbourhood of Grahamstown, Schonland 3301, 4477, 4478, Dyer 162, 211, Rogers 27671, Britten 1504; Blaauwkrantz, Britten 2738; Lushington valley, May, Schonland 5169 (fr.); Kareiga R. forest, Britten 2498; Port Alfred, Tyson 50, Schlechter 2735, Britten 1883, 1828 [Port Natal, Gueinzius, Sanderson—teste Sonder l.c. 511].

In many respects this species approaches *Rh. MacOwani*; in fact, it looks like a small-leaved form of it, but its leaflets have not got reticulate venation and inflorescences, flowers and drupes are different.

17. **Rh. fastigiata** E. et Z. in Enum. 1107.

Rh. puberula E. et Z. var. *fastigiata* Sonder l.c. 511; Engler l.c. 427.
? *Rh. sericea* E. et Z. in Enum. 1105.
Rh. humilis E. et Z. in Enum. 1108.

Description: Much branched bush, 2–9 feet high, with slender terete branchlets, which, like the leaflets, petioles and branchlets, are shortly adpressed pubescent. Leaves petioled; petiole subsemiterete, furrowed above. Leaflets dark green above, paler green on lower side, subcoriaceous, oblong-acute or elliptic-lanceolate narrowed at the base, sometimes obtuse or mucronulate, mucro often plicate, surface in adult leaflets often subglabrous, margin entire narrowly revolute; midrib slightly prominent on upper surface, more so on lower; lateral veins few, slightly prominent above, more so on lower surface, slightly branched towards the margin of the leaflets. Panicles very lax, lateral in the axils

of the upper leaves (shorter than the leaves) and terminal about as long as the leaves. Bracts very small. Calyx lobes broadly ovate, very obtuse, very pale greenish white. Petals oblong, very pale yellowish white. Drupe subglobose, glabrous.

Length of petiole 5–8 mm. ; terminal leaflets 2–3 cm.
Breadth of terminal leaflets 4–8 mm. Lateral leaflets about two-thirds the size of the terminal.
Length of pedicels 1–2 mm. ; calyx lobes barely ½ mm. ; petals about 1½ mm.
Diameter of drupe 3–3½ mm.

Gane 325, from the " Mayor's Seat " near Grahamstown, has perfectly hermaphrodite flowers.

Rh. fastigiata E. et Z. MacOwan 766. Upper side.

Distribution : In the coast districts from the Uitenhage division to Natal, extending inland to the Katberg and Amatola mountains.

No absolutely sharp line separates this species from *Rh. pyroides* Burch. (non Sond. nec Engler) var. *puberula*, but the absence of reticulate venation (except in coppice shoots) in *Rh. fastigiata* defines it sufficiently. The leaflets of *Rh. fastigiata* are shorter and narrower than in *Rh. pyroides*, but this difference becomes less in coppice shoots of the former. The lateral veins are generally much more distinct in *Rh. fastigiata*. The fastigiate habit cannot be used as distinguishing character, but is common in the species.

Uitenhage and Albany districts, E. et Z. 1107 ; Addo hills, E. et Z. 1108 (*Rh. humilis* E. & Z.) ; Z. 887 ; Van Stadens, Paterson 1987 ; Zuurberg, Paterson 18 ; very common in the neighbourhood of Grahamstown, especially south of it, MacOwan 265, 766, Britten 2807, 5171, 5172, 5173 (coppice shoot), Salisbury 208 (not typical : leaflets more leathery, petioles only about 3 mm. long, lateral veins often not distinct ; perhaps *Rh. fastigiata* x *lucida*), Z. 2239, E. 887 (from the neighbourhood of the locality of the type of *Rh. sericea* E. et Z.) ; Wolfridge, Amatolas, c. 5,000 feet, Hunter 5086*a* ; wooded kloof, Fort Cunyngham, 3,300 feet, Galpin 2480 ; Komgha, 2,000 feet, Apr., Flanagan 800, Schlechter 6164 ; Ntsubane, near Lusikisiki, Fraser 5097 ; near Murchison, Wood 3126 ; Natal, Gerrard 1879 ; Burchell 4744, 4814 ; Drège (named *Rh. angustifolia* L. a.) ; Herb. Thuberg (*Rh. escisum* fol. *a*).

18. **Rh. Dinteri** Engl. in " Pflanzenwelt Afrikas " III, 2, 211, fig. 103, E. to G.
Rh. impermeabilis Dinter Ms.
Allied to *Rh. refracta*.

Description : A much branched thorny shrub up to about 6 feet high, with subterete pubescent or subtomentose branchlets. Leaves petiolate, petioles about half the length of the terminal leaflets or slightly longer, pubescent, slightly furrowed above. Leaflets glaucous, obovate or oblong, usually slightly plicate-mucronulate at the apex, cuneate at the base (the terminal often much contracted) ; margin usually entire, very slightly revolute ; pubescent on both surfaces, but hairs longer on the lower surface ; midrib and lateral veins slightly prominent on both surfaces, more on the lower than upper surface, lateral veins few, arcuate, slightly branched, tertiary veins distinct, reticulate. Panicles subtomentose, axillary and terminal, slightly shorter than the leaves, or the terminal ones a little longer, laxly few-flowered, flowers pedicellate. Calyx lobes ovate. Petals oblong. Drupe subglobose.

Length of petioles 6–9 mm. ; terminal leaflets 1–2·2 cm. ; lateral leaflets ·8–1·6 cm.
Breadth of terminal leaflets ·8–1·5 cm. ; lateral leaflets ·5–1·1 cm.
Length of pedicels about 1 mm. ; calyx lobes about ¾ mm. ; petals about 1½ mm.
Diameter of drupe about 4 mm.

Rh. Dinteri Engl. Dinter 4359. Upper side.

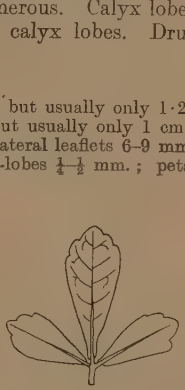
Distribution : Restricted to the South-West Protectorate.

Schaaprivier, Mar. (fr.), Dinter 1898 ; Lichtenstein and Hohenwarte, Anas mountains, Dec. (fr.), Dinter 4359 ; between Haris and the Anas mountains, on plateau in sandy ground (young fr.), Pearson 9507 (one leaf with five leaflets).

19. **Rh. crenata** Thunb. in Fl. Cap. ed. Schultes 266, Sonder l.c. 512 ; Engler l.c. 422 ; Diels l.c. 577, 631.

Description : Much branched shrub, usually about 3–7 feet high, with terete, shortly greyish or rufous villous branches. Leaves shortly petiolate, petioles relatively thick. Leaflets without ordinary hairs, rigid, membranous, sessile, dark green or greyish green above, often rufous on the lower side, obovate-cuneate, margin slightly revolute, 3–5 crenate at the blunt apex, midrib and the few lateral veins slightly prominent on both surfaces, no tertiary veins. Panicles shortly villous, axillary not confined to the very apex of the branches, shorter or the male ones longer than the leaves, terminal longer than leaves, multiflowered. Bracts small, acuminate, pilose. Flowers shortly pedicellate, very often 4-merous, often 5-merous, rarely 6-merous. Calyx lobes ovate acute, pilose. Petals oblong, about three times the size of the calyx lobes. Drupe fleshy, almost black when ripe, subglobose.

Length of petioles about 2 mm.
Length of terminal leaflets 1·2–2·5 cm., but usually only 1·2–1·5 cm. and breadth in proportion.
Length of lateral leaflets ·5–1·7 mm., but usually only 1 cm., and breadth in proportion.
Breadth of terminal leaflets 5–9 mm. ; lateral leaflets 6–9 mm.
Length of pedicels about 2 mm. ; calyx-lobes ¼–½ mm. ; petals 1¼–1½ mm.
Diameter of drupe about 4 mm.



Rh. crenata Thunb. Daly 1065. Under side.

Distribution : On fixed sandhills along the coast from the Cape Peninsula to the Kei River mouth, flowering and fruiting almost throughout the year. A sand-dune fixed chiefly by *Rh. crenata* and *Myrica cordifolia* L. is figured by Marloth (Das Kapland 1908, fig. 10). The former favours the ridges.

Type in Herb. Thunberg, Upsala; Burchell 5331 (only few leaves crenate at the apex); between Retreat and Diep River, Dümmer 1519; Cape Flats, about 2 miles from Eerste River, Van Roeper 5058; Wagenhuis Krans, Bredasdorp, Fry in herb. Galpin 4975; sandy places near the Onrustriver, 10 feet, Schlechter 10394; Great Brak River, 30 feet, Schlechter 5738; seashore, Plettenberg Bay, Fourcade 596; Groot River mouth, Zahn 5039; sandhills on the shore near Cape Recief, E. & Z. 1123; neighbourhood of Port Elizabeth, Ecklon 20, Paterson 1108, Cooper 1571, J. Sim 36, Daly 1065, Kemsley 316; neighbourhood of Port Alfred, Hutton 988, Burchell 3829, 3830, Britten 1910, 2751, White 61, Salisbury 130 (p. pte.); East London, Rattray 35, Galpin 5688; Keimouth, Flanagan 846.

20. **Rh. Pentheri** Zahlbr. in " Plantae Pentherianae " (Ann. Hofmus. Wien XV, 52).
Rh. cuneata N.E. Br. in Kew Bull. 1906, 17.

Zahlbruckner compares this species to *Rh. undulata* Jacq., and *Rh. krebsiana* Presl, with neither of which, however, it is allied. N. E. Brown says that *Rh. cuneata* [which must be sunk in *Rh. Pentheri*] " is allied to *Rh. crenata*, but easily distinguished because the leaves are without glands on the under surface ". To my mind, it is also allied to *Rh. refracta* E. et Z.

Description: A much branched shrub up to 9 feet high, branchlets subterete cinereo-villous. Leaves petioled, petioles subterete canaliculate above, usually about half the length of the terminal leaflets, sparsely pilose. Leaflets membranous, at first covered with sparsely adpressed hairs, later glabrescent or glabrous, dark green above, paler below, elongate obovate-cuneate, apex obtuse, tridentate or emarginate, margin slightly revolute, midrib prominent on both surfaces, lateral veins very slightly branched outwards and very slightly prominent on both surfaces, tertiary veins few, coarsely reticulate, but barely visible or invisible in dried specimens. Panicles cinereo-pubescent, lateral and terminal, laxly branched, usually shorter than the leaves. Bracts minute, ovate oblong or oblong subacute, pedicels short. Calyx lobes triangular-ovate, obtuse, pubescent. Petals ovate. Drupe globose, laterally somewhat compressed and slightly depressed, shining brown when ripe.

Length of petioles 5–13 mm.; terminal leaflets 2–3 cm.; lateral leaflets 1–1·5 cm.
Breadth of terminal leaflets 4–12 mm.; lateral leaflets about ·5 cm.
Length of inflorescences 2·5–7 cm.; pedicels 1–1·5 mm.; calyx lobes about ·5 mm.
Length of petals 1·2–1·4 mm
Drupe: about 3 mm. high and about 3·5 mm. greatest diameter.

Rh. Pentheri Zahlbr. Schlechter 6301. Under side.

Distribution: Bashee, Pondoland, eastern Orange Free State, Natal, Barberton and Lydenburg districts of the Transvaal.

Near Colossa, Natal [Colenso ? S. Sch.], leg. Krook, Penther 2290 in Herb. Vienna; on a rocky hill near Ladysmith, 3,000 feet, Wood 5706 in Herb. Kew and Herb. Bolus (type of *Rh. cuneata* N.E. Br.); Bashee River, 2,500 feet, Schlechter 6301; Lusikisiki, Ntsubane forest station, Fraser 5163; woods near Gromberg, Natal, Wood 891; Inanda, Wood, 1319; Illovo, Wood 3106; Natal, Gueinzius, Sutherland and Gerrard 1394 in Herb. Kew; between Pinetown and Umbilo, Rehmann 8072; Umkomanzi, 3,000 feet, Schlechter 6690; Arnoldsfarm, Newcastle, Rehmann 7052; common in low forest in the Barberton and Lydenburg districts, Keet 1432 (5159), 5160, 1485.

21. **Rh. divaricata** E. et Z. in Enum. 1106; Sonder l.c. 508; Engler l.c. 429; Diels l.c. 582.

Description: A small shrub with spreading branches; branchlets terete and like the petioles minutely pubescent. Leaves petiolate, petioles about half to two-thirds of the length of the terminal leaflet, furrowed above. Leaflets subcoriaceous, sessile, ovate or obovate, obtuse and plicate-mucronulate or emarginate, the terminal cuneate at the base, margin entire or paucidentate, slightly revolute, above puberulous and with the exception of the rufescent veins dark green, below very shortly whitish or fulvous glandular tomentose eventually subglabrous; midrib and the few slightly branched lateral veins slightly prominent on both surfaces, tertiary veins very indistinct. Panicles axillary and terminal, sparsely flowered, pubescent, shorter than the leaves. Flowers pedicellate. Calyx densely pilose, segments oblong, triangular. Petals oblong, sparsely pilose. Drupe (*fide* Sonder) globose, smooth, tipped with the three styles.

Length of petioles 7–14 mm.; terminal leaflets 1·5–2 cm.; lateral leaflets 1·5 cm.
Breadth of terminal leaflets 4–6 mm.; lateral leaflets 4–6 mm.
Length of panicles 1–3 cm.; pedicels 1–3 mm.; calyx lobes nearly 1 mm.; petals 2 mm.

Rh. divaricata E. et Z. Galpin 2540. Upper side.

Distribution: Mountains from the neighbourhood of Queenstown to Basutoland and Ladybrand, Orange Free State, also in the Transvaal (?).

The description and measurements are taken from what I consider to be typical specimens.

Mountain sides on the Klipplaat River (Tambukiland), Alt. 5, Nov. (fl.). E. et Z. 1106, Ecklon 5 (in Herb. S.A. Mus.); Andriesberg, Jan., Galpin 2540.

There are a few other specimens which differ more or less, but which seem to have to be referred to the same species.

Aliwal North, 5–6,000 feet, Drège 6796 in Herb. Kew (leaves up to 3 cm. long). This is *Rh. subferruginata* Presl Bem.

Leribe, Basutoland, 5–6,000 feet, Dieterlen 17 (wrongly named *Rh. pyroides* Burch. in Herb. S.A. Mus.). Terminal leaflets up to 2·3 cm. long, 1·5 cm. broad. Many leaves have more or less crenate margins in the upper part. Drupe about 4 mm. in diameter.

Rh. divaricata E. et Z., var. *fulvescens* Engl. Rehmann (type).

Mountain slopes, Leribe, Basutoland, shrub, fl. white. Dieterlen 17*b* (wrongly named *Rh. Zeyheri* Sond.). This has remarkably slender petioles (up to 4 cm. long). The largest terminal leaflets are 3·5 cm. long. The texture, venation and pubescence of the leaflets are the same as in the type, also the flowers. The margin of the leaflets show sometimes a few crenate teeth. The leaflets are obovate, narrowly cuneate at base.—Scattered over the mountains at Ladybrand, Orange Free State (Patterson 5134), there is a large-leaved form with fruits as in Dieterlen 17*a* (subglobose, brown, shining, c. 4 mm. in diameter). The petioles are 2–2·5 cm. long. The largest terminal leaflets are 5 cm. by 2·2 cm. broad, the lateral leaflets belonging to them about 3·5 cm. long.

Then there are Dieterlen 17*c* and Phillips 753 (Leribe in Herb. S.A. Mus.). These give one the impression of being coppice shoots; in the latter the leaflets reach a length of 6 cm. The shape of the leaves, especially in Dieterlen 17*c*, varies considerably; some are distinctly acute.

The material of *Rh. fulvescens* Engl. in Herb. Berol. (*Rh. divaricata* var. *fulvescens* Engl. l.c. 429). Diels l.c. 582, collected by Rehmann at Trigaardsfontein, Transvaal, is hardly sufficient to judge whether or not it should be placed with *Rh. divaricata*. The leaflets are paucidentate.

22. **Rh. rupicola** Wood et Evans in Journ. of Bot. 1897, 350.

Rh. Tysoni Phillips in Ann. S. Afr. IX, 119.

? *Rh. colensoana* Engl. in Pflanzenwelt Afrikas III, 2.

Description: Erect, much branched shrub with terete branches, at first tomentose, later often glabrescent. Branchlets short, ascending, terete, tomentose or softly pilose. Leaves petiolate, petioles furrowed above, pilose, usually little more than half the length of the terminal leaflet. Leaflets broadly obovate or obovate-elliptical, at the apex obtuse, subobtuse or slightly emarginate, usually very distinctly plicate-mucronate; at the base cuneate, frequently (especially the terminal ones) subpetiolulate or petiolulate, surfaces more or less softly pilose at first, later more or less glabrous; margin entire, slightly revolute; midrib barely prominent above, strongly prominent below, lateral veins few, unbranched or slightly branched near the margin, delicate above, distinctly prominent below, tertiary veins few, reticulate and very indistinct. Panicles pubescent, axillary (smaller than the leaves) and terminal (longer then the leaves), lax, few flowered with pedicelled flowers and minute subulate bracts. Calyx lobes ovate, subglabrous or pubescent. Petals oblong. Drupe subglobose a little broader than high.

Average length of petioles about 7 mm.; terminal leaflets about 1·3 cm.; lateral leaflets about 1 cm.
Average breadth of terminal leaflets about 8 mm.; lateral leaflets about 5 mm.
Length of axillary panicles about 1 cm.; terminal panicles 2–2·5 cm.
Length of pedicels about 1 mm.; calyx lobes about $\frac{3}{4}$ mm.; petals $1\frac{1}{4}$–$1\frac{1}{2}$ mm.
Diameter of drupe about 4 mm.

Rh. rupicola Wood et Evans. Wood 3932. Under side.

Distribution: Mountains of Griqualand East and Natal at an altitude of 4,500 to 5,500 feet.

In a rocky valley, Liddesdale, Maritzburg county, 4–5,000 feet. Feb. (fl. and fr.), Wood 801, 3932; Malowe forest subreserve, district Umzimkulu, 4,500 feet, Jan. (fl.), Miller D. 326 (a small shrub about 2 feet high in grassland, probably dwarfed by grazing and burning, only one plant seen); amongst rocks at Sibiskraal, near Matatiele, Tyson 1268; Zuurbergen, Natal, 5,500 feet, Schlechter 6584. The last two have leaves more hairy than the others on the surface and ciliate on the margin.

Wood and Evans think that this species is allied to *Rh. mucronata*, while Phillips thinks it is allied to *Rh. glauca*. Both of these suggestions are clearly wrong.

LEGATI group.

23. **Rh. Legati** Schonl. nom. nov.

Rh. laevigata Thunb. (in Prodr. 52 and Fl. Cap. ed. Schultes, 264) et auct. plur., non Linn.; E. et Z. in Enum. 1096; Pappe, Sylv. cap. 12; Sonder l.c. 514; Engler l.c. 443; Diels l.c. 589, 639; Sim, Forest Flora 195, t. XLIV.

Rh. acuminata E. Mey. in Herb. Drège; *Rh. crassinervia* Presl Bem. 42.

Description: A shrub or (usually) a tree, often reaching a height of 50 to 80 feet, glabrous or rarely slightly pilose, with reddish, striate branchlets. Stems of young plants and of coppice shoots thorny. Leaves petiolate, petioles slender, furrowed above, variable in length, but often more than three-quarters the length of the terminal leaflets. Leaflets dark green or reddish, firmly membranous, ovate or oblong, acuminate, with a cuneate base which is often, especially in the terminal leaflets, contracted to form a petiolule; surface slightly undulate, margin entire or rarely paucidentate; midrib raised slightly on lower surface, lateral veins delicately curved, slightly raised, tertiary reticulate, immersed. Panicles richly and delicately branched, male chiefly terminal, much exceeding the leaves in length and much longer than the female which are mostly in the axils of the upper leaves; bracts minute, subulate, pedicels very delicate, longer than flowers. Calyx lobes ovate, subacute not quite half the length of the ovate-acute pale green or yellowish petals. Drupe red, shining, subglobose.

Length of petioles 4–7 cm.
Length of terminal leaflets 7–13 cm. Breadth of terminal leaflets 2–4 cm.
Length of lateral leaflets 5·5–10·5 cm. Breadth of lateral leaflets 2·4 cm.
Length of pedicels 2–5 mm.; calyx lobes barely ½ mm.; petals barely 1¼ mm.
Diameter of drupe 4–6 mm. (usually 5 mm.).

Distribution: In the coast districts from the Grootvadersbosch, Swellendam, to Natal, extending somewhat inland even to the northern Transvaal from near sea-level to nearly 6,000 feet. Rarely absent from forests and forest patches, also frequent in stream-bank bush.

On the edges of forests and in stream-bank bush usually a large bush or small tree with smaller leaves and fruit than when growing in forest, where it always develops into a conspicuous tree.

The tree is known as the "Red Currant tree". It is also known as "Kiriehout" and "Bush Jarrah". In western districts of Cape Colony it is called "Essenhout", the natives of the eastern districts call it "Bosganna".

The wood is red, hard, used by natives for pipes and fancy sticks, sometimes used for yokes and skeys, but not much used by sawyers. Drupe sweetish, when ripe, and eaten by natives, monkeys, and birds. When the stem is cut into or bruised it exudes blood-red sap.

I have felt compelled to give this plant a new name after inspecting Linnaeus' type of *Rh. laevigata* and Thunberg's plant, which he and numerous other authors have called *Rh. laevigata*. The two synonyms could not be adopted either. *Rh. acuminata* E. Mey. must be dropped because there is already a *Rh. acuminata* DC. (=*succedanea* Linn. from Eastern Asia). Nor can I accept *Rh. crassinervia* Presl, because Presl did not characterize his species. Moreover, the name would be most inappropriate. I have taken the liberty to name it after Mr. C. E. Legat, Chief Conservator of Forests, Union of South Africa, under whose direction the Forestry Department has given me much assistance by the supply of material and information.

In view of the fact that the species, within the limits mentioned, has such a universal distribution, I do not, as a rule, quote exact localities of the perfectly glabrous specimens I have examined. Cape Colony: Herb. Thunberg (*Rh. laevigata* Thunb. non Linn.); Burchell 7224, 4485; Drège 3451, 3452, 3568 (*Rh. acuminata* E. Mey.); E. et Z. 1096; Z. 25; Cooper 1548; Jordaan (5106); Duthie 23, 35; Schlechter 5912, 5912*a*; Fourcade 1084; Zahn (5017); Paterson 1985; E. et Z. 314; Paterson 1911*a*; Holland

Rh. Legati Schonl. Paterson 1911*a*. Upper side.

294 (Zuurberg, drupes exceptionally large, about 6 mm. in diameter); MacOwan 294; Britten 1573; Schonland 3143 (2 miles beyond Stone's hill, Grahamstown, leaves exceptionally broad, up to 6·5 cm. and terminal up to 12 cm. long, more leathery than usual); Hoesslin (5126); Staples (4492, 4494, 4495); Dyer 790; Stayner 80; Hunter (5031); Sim 1990; Tyson 2591, 3133; Hilner 144; Schlechter 6176; Flanagan 766; Kolbe and Pegler 3; Van der Merwe (5103); Bennie 392; Dwyer (5114); Tyson 3134; Fegen (5161); Fraser 5036. Natal: ? (5024—Ingwangwane, near Riverside station); Wood 789. 2525; Rudatis 558, 1290; Krauss 124; Gerrard 74, 524; Transvaal (near Vryheid, Waterval Boven, Zoutpansberg, and Pietersburg divisions): Tusten (5056); ? (5006), Rogers 18070, 22034; Pole Evans 16934, 16941.

HYBRIDS: Occasionally one finds slightly pilose specimens in the neighbourhood of typically glabrous ones. Whether this is due to hybridization cannot be decided at present. Amongst these are:—

Duthie (25901) in (Herb. S.A. Mus.), Knysna; Mund (in Herb. S.A. Mus.), Zitzikamma forest; Tusten (5122), Ngomi forest reserve, P.O. Hlobane, near Vryheid.

On the other hand, where this species occurs with *Rh. dentata*, there are frequently found forms intermediate between them, about the hybrid character of which there can be no reasonable doubt. These are referred to under *Rh. dentata*. Dr. J. Muir (n. 3474) sent me a specimen from Vet River, near Novo, which I look upon as a hybrid between *Rh. Legati* and *Rh. mucronata*. It resembles the former in the nature of the inflorescence, shape and waviness of some leaves. The petioles vary much in length (from less than half to over half the length of the terminal leaflets). The leaflets are more leathery than in *Rh. Legati* and have very distinct reticulate venation. The flowers are larger than in *Rh. Legati* (petals $1\frac{1}{2}$ mm.). Petioles and inflorescences are sparingly hairy and the leaflets also show a few hairs. (See further *Rh. carnosula* Schonl.)

24. **Rh. transvaalensis** Engl. l.c. 440; Diels l.c. 638.*

DESCRIPTION: A much branched shrub, generally 3 to 4 feet high, but sometimes reaching a height of 12 to 15 feet. Young branches villous, soon becoming glabrescent. Leaves petiolate, petioles rather slender, half to two-thirds the length of the terminal leaflets, furrowed above, more or less pilose, strongly so on the edges of the furrows. Leaflets subcoriaceous, green, paler on the lower surface, the younger more or less pilose, the older sometimes quite glabrous, oblong-elliptical or oblong-lanceolate, narrowed at the base and apex, acute, mucronulate, margin slightly thickened, often slightly undulate, venation reticulate, not prominent, except the midrib and, to a slight extent, the lateral veins on the lower surface. Panicles numerous, lateral, few-flowered, shorter than leaves, pilose, bracts small subulate, flowers pedicellate. Calyx lobes oblong-obtuse. Petals oblong. Drupe subglobose, shining, pale red or nearly white.

Rh. transvaalensis Engl. (5005). Under side.

Length of petioles one-half to two-thirds of terminal leaflets.
Length of terminal leaflets 2·5–4 cm. Breadth of terminal leaflets 1–1·3 cm.
Length and breadth of lateral leaflets one-half to two-thirds of the terminal.
Length of fruiting pedicels 2–4 mm.; calyx lobes nearly 1 mm.
Diameter of drupes about 4 mm.

**R. transvaalensis* Engl. should be better placed next to *Rh. pyroides* var. *puberula* and may perhaps even have to be sunk in it. I only recognised this when it was too late to alter the arrangement of the species.

DISTRIBUTION : Common along streams and in scrub-forest on the Drakensberg in the Barberton and Lydenburg districts.

Houtbosch, Rehmann ; "Hilltop", Barberton district, Nov., Keet 1456 ; Halic forest station, Zoutpansberg, Dec., Albany Mus. Herb. 5005 (fr.) ; Ngomi, 15 miles from Vryheid, 2,000–4,000 feet, Jan., Forester Tusten 5057 (fr.).

25. **Rh. Zeyheri** Sond. l.c. 514 ; Engler l.c. 433 ; Diels l.c. 584, 639.
Rh. glauco-virens Engl. l.c. 432 ; Diels l.c. 584.

Diels states that Engler's species is difficult to separate from *Rh. Zeyheri*. Engler, in his key to the species of *Rhus* in "Pflanzenwelt Afrikas" III, 2, 213, places *Rh. Zeyheri* under *Rh. mucronata* Thunb., while keeping up *Rh. glauco-virens*.

DESCRIPTION : A perfectly glabrous, much branched shrub with slightly angular, often purplish branchlets. Leaves petiolate, petioles rather slender, half to two-thirds the length of the terminal leaflets, slightly furrowed above. Leaflets glaucous green, slightly lighter on the lower surface, sessile or the terminal petiolulate, obovate or obovate-oblong, cuneate at the base, obtuse, acute or apiculate, often mucronulate ; margin entire or rarely paucidentate, flat ; midrib somewhat prominent on both surfaces, lateral veins slightly prominent on both surfaces, tertiary veins reticulate, immersed. Panicles laxly flowered, axillary shorter than the leaves, terminal somewhat longer, bracts subulate, flowers pedicellate. Calyx lobes ovate, obtuse. Petals oblong, yellowish. Drupe fleshy, brown, shining, subglobose.

Length of petioles 1–1·5 cm.
Length of terminal leaflets 2–3 cm. (rarely up to 6 cm.). Breadth of terminal leaflets about 1·7 cm.
Lateral leaflets barely two-thirds the size of the terminal leaflets.
Length of calyx lobes about $\frac{3}{4}$ mm. (variable in size in the same flower sometimes).
Length of petals about $1\frac{1}{4}$–$1\frac{1}{2}$ mm. Diameter of drupe 5–5·5 mm.

Rh. Zeyheri Sond. Rehmann 4740. Under side.

DISTRIBUTION : On edge of streams and on kopjes near Pretoria, varying considerably according to habitat. Also recorded from the Drakensberg.

Z. 345 (Herb. Kew : type of *Rh. Zeyheri* Sond.) ; Rehmann 4740 (type of *Rh. glauco-virens* Engl.) Burtt-Davy 291, 2532, 2691 ; McLea in Herb. Bolus 5618 ; Leendertz 83, 324, Verdoorn 8, Schlecht 3626, Sturdy 4266.

At Groenkloof, near Pretoria, a form with deep-green leaves occurs (Howlett 5 and 5*a*). It cannot be separated by any other character from the type. Some of Pole Evans's specimens from Irene were named by Burtt-Davy *Rh. puberula* var. *Zeyheriana*.

LUCIDA group.

26. **Rh. lucida** L.Sp. Pl. 382 ; *Rh. lucida* β Ait. hort. Kew, ed. 2, 11, 266 ; Comm. hort. 1, t. 93 ; Thunb. Fl. Cap., ed. Schultes 264 ; Jacq. hort. Schoenbr. t. 347 ; Engler l.c. 413 ; Diels l.c. 574, 632, fig. 7 A, B (p. 634) ; *Rh. Cavanillesii* DC. Prodr. II, 69 ; *Rh. outeniquensis* Scz. ; *Rh. scoparia* E. & Z.

Rh. lucida L., is, in eighteenth century collections, often mixed up with *Rh. glauca*. However, this has usually obcordate thinner leaflets with lateral veins placed close together, etc. There is a scrap (without flowers) in the Plukenet Collection, British Museum, named *Rh. lucidum* Mill. Pluk. t. 219, fig. 9, which appears to be typical *Rh. lucida* L. Amongst typical specimens of *Rh. lucida* which are found in many herbaria, E. & Z. 1113, from the Lion's Head, Capetown, and MacOwan 1827 in Herb. Austr. Afr. from Constantia may be mentioned. Such typical specimens can easily be distinguished from typical *Rh. scoparia* E. et Z., but, having examined a large amount of material, I am unable to separate the latter sharply from *Rh. lucida*. Already Diels (l.c. 575) has, contrary to Sonder, stated that the characters of *Rh. scoparia* : " short petioles, smaller leaves, longer downy panicles " have no systematic value, though I have long hesitated to unite these two species, since *Rh. Schlechteri* might then also have to come into *Rh. lucida*.

The varieties established by Sonder l.c. 517 cannot be kept up. I divide *Rh. lucida* into three varieties :—

A. *typica*, B. *outeniquensis* (*Rh. outeniquensis* Szysz.), and C. *scoparia* (*Rh. scoparia* E. et Z.).

The wood is used for fencing posts and spokes in the Knysna division.

Description : A much branched shrub, often over 10 feet high, with pulverulent-puberulous or shortly downy branchlets, sometimes covered with resinous excretion. Leaves petioled, petioles of variable length, slightly winged and canaliculate above. Leaflets often glossy, subcoriaceous, obovate-oblong, cuneate at the base, quite blunt or subacuminate, rarely emarginate or coarsely crenate at the apex. Midrib slightly prominent, lateral veins delicate but distinct, tertiary veins usually not visible. Panicles lateral and terminal, shorter or slightly longer than the leaves, puberulous or covered with resin, lax. Flowers sometimes hermaphrodite, shortly pedicelled. Calyx lobes subtriangular-ovate, often puberulous. Petals oblong, about three times the length of the calyx lobes. Drupe brown, shining, subglobose.

Length of petioles from 1 mm. to 3·5 cm. (see varieties).
Length of terminal leaflets 1½–7 cm. Breadth of leaflets 5 mm. to 2½ cm.
Lateral leaflets about two-thirds the size of the terminal leaflets.
Length of pedicels 1–2 mm. ; calyx lobes about ½ mm. ; petals 1¼–1½ mm.
Diameter of drupe 3–5 mm.

Rh. lucida L., A. *typica* E. et Z. 1113. Under side.

Distribution : On edges of scrub and forests and isolated on mountain slopes in the coast districts from the neighbourhood of Capetown to Natal (also found in Gazaland at an altitude of 7,000 feet : Swynnerton M 635).

A. *typica*.—Petioles usually 5–6 mm. long. Terminal leaflets usually about 3½–4 cm. long (except in coppice shoots, in which they may exceed 6 cm. in length). Drupe (as far as known) c. 3½ mm. in diameter.

Common on hillsides near Capetown, e.g. E. et Z. 35, 113, Wolley Dod 2029, Schlechter 1333, Drège 6791 (var. *subdentata* DC.), 6802, MacOwan in Herb. Austr. Afr. 1827, Rogers 11242, Lichtenstein 193, Wilms 3123, Engler 52, 55 ; in dunes at the mouth of the Onrust River, Z. 2235, 2248 (var. *elliptica* Sond.) ; hills near Paarl, 300 feet, Schlechter 9208 ; edge of bank of Knysna River, Schonland 3430 ; northern slopes of Knysna Heads, 50–200 feet, Schonland 3378 ; Humansdorp division, Rogers 28266 ; ridges near Groendal, Zwartkops River valley, common, J. Sim 227 ; Springfields, near Uitenhage, J. Sim 129 ; Port Alfred, Rogers 28036 (leaflets more decidedly narrowed in lower part than usual, many crenato-dentate at apex) ; Blaauwkrantz, Hilner 63 ; common on the hills south of Grahamstown, e.g. Britten 1608, 1522, 1593, 1594, 2179, Schonland 1892 (very near *Rh. scoparia* E. & Z.), 82 (not distinguishable from Capetown specimens) ; Aylesby, near Riebeek East, Schonland ; margins of lower forest, Hogsback, Rattray 357 ; Fort Cunynghame, Sim 2185 ; Ntsubane, near Lusikisiki, Fraser (5137, 5144) ; Bushmans River valley, Natal, Wood 10635 ; Friedenau, Umgaye flats, Alexandra county, c. 700 m., Rudatis 115, 1130.

B. *outeniquensis* (*Rh. outeniquensis* Scz. in Polypetalae Disciflorae Rehmannianae, Cracoviae 1888, 52).—Branchlets more slender than usual, leaves larger than in A, drupe larger. Petiole generally about 1 cm. long, terminal leaflets generally 5–7 cm. long, drupe (as far as known) 3½–5 mm. in diameter.

Rh. lucida L., B, *outeniquensis*. Fourcade 8. Under side.

Montagu Pass, Rehmann 272 in Herb. Berol. ; Piquetberg, 1,000–1,500 feet, Schlechter 5199; Kl. Kruis R., Muir 3475 ; Muiskraal, Garcias Pass, 1,000 feet, Galpin 3895 ; Gr. Brak R., 30 feet, Schlechter 5737 ; Rust en Vrede, Oudtshoorn, 3,000 feet, Dyer 85 ; Uniondale, Paterson 3019 ; Knysna heads, Williamson 29 ; Sourflats, Knysna, Keet 447, 612, 614, 615 ; Gully, north-east of Royal Hotel, Knysna, Schonland 3494 ; Knysna, Marloth 7917 (petioles up to 2·5 cm. long) ; Blaauwkrantz forest reserve, Zahn (5014, 5027, 5028 (petioles in 5027 up to 3 cm. long) ; margin of coast forest, Ratelsbosch, 600 feet, Fourcade 8 (petioles up to 1½ cm. long) ; Van Stadens, Paterson 736.

Perhaps Schlechter 6754 collected at Van Reenen belongs here also. The petioles here reach a length of 3·5 cm.

C. *scoparia* (*Rh. scoparia* E. et Z. in Enum. 1122, Sonder l.c. 518, Engler l.c. 415; Diels l.c. 575, 632).—Petioles 1–4 mm. long. Terminal leaflets generally $1\frac{1}{2}$–$2\frac{1}{2}$ cm. long. Drupe (as far as known) about 3 mm. in diameter.

Rh. lucida L. (close to var. C. *scoparia*). Schonland 1892. Upper side.

Olifantshoek, Alexandria division, E. & Z. 1122; Nieuweveldberge, Drège 6803; Knysna commonage, not common, 600 feet, Keet 660; Humansdorp, under 500 feet, Rogers 2908; Longvale, P.O. de Kol, Alexandria division, common, Gant 47; Springfields, Uitenhage, J. Sim 129; road from Port Alfred to Three Sisters, Britten 720; hills south of Grahamstown, Schonland 615, Britten 1594, 2804.

The following comparative notes on the structure of the leaves taken from Diels l.c. 575 are of interest:—

Rh. lucida L.	*Rh. scoparia* E. et Z.	*Rh. Schlechteri* Diels.
Hairs—	Hairs—	Hairs—
Glandular scales on both surfaces (Pl. XIV O)	Numerous glandular scales on both surfaces.	Glands especially active when young.
Epidermis—	Epidermis—	Epidermis—
Lumen, 10–15 μ.	Lumen, 10–15 μ.	Lumen, 15–20 μ.
Wall, 3–5 μ.	Wall, 5–7 μ.	Wall, 6–12 μ.
Ground tissue—	Ground tissue—	Ground tissue—
Only the outer layer palisade like.	Loosely palisade like.	Loosely palisade like.
Stomata—	Stomata—	Stomata—
Only on lower surface, slightly raised.	Many on lower surface, slightly raised.	On lower surface, numerous, not raised.

These notes confirm, as far as they go, the general impression one gains in handling these species: that they form a series towards more and more decided xerophytism, and it is a great pity that cultural data are hitherto absent to decide in how far their characters have become fixed or not.

Hybridization: Occasionally one finds forms which lead to the conclusion that hybrids with *Rh. glauca* Thunb. and allied species occur. The var. *elliptica* Sond. (e.g. Z. 2248 from downs near Onrust River) seems to be composed of such hybrids.

27. **Rhus Schlechteri** Diels in Engl. Bot. Jahrb. XXIV (1898), 501; ib., 575, 634, fig. 7 E.

This species is very close to *Rh. lucida* var. *scoparia*. The practically sessile and relatively broader leaves distinguish it from this species. Diels describes it from Schlechter's specimens, collected at Elim, which are without flowers and fruits.

Description: A much branched shrub up to 10 feet in height with short, densely leafy, slightly angular branchlets, which are pubescent when young and become glabrous later. Leaves sessile. Leaflets subcoriaceous, often with a resinous secretion which may, on drying, form a thin greyish crust, obovate or obcordate-cuneate, at the apex obtuse, subtruncate or slightly emarginate; margin entire; midrib slightly raised, lateral veins immersed or slightly raised, tertiary veins rarely visible. Panicles lateral and terminal slightly longer (or female shorter) than the leaves, laxly flowered. Flowers pedicellate. Sepals ovate, obtuse. Petals oblong. Drupe globose, shining.

Length of terminal leaflets 8–14 mm. Breadth of terminal leaflets 5–10 mm.
Lateral leaflets about two-thirds the size of terminal ones.
Length of pedicels about 1½ mm. ; calyx lobes ½ mm. ; petals about 1½ mm.
Diameter of drupe (in J. Sim 78) 4 mm.

Rh. Schlechteri Diels. Burchell 4522. **Under side.**

DISTRIBUTION : Chiefly on fixed sand-dunes from Bredasdorp division to the neighbourhood of Port Alfred, often gregarious and dense.

On rocky places near Elim, Bredasdorp division, about 150 m., Schlechter 7624 in Herb. Berlin ; Burchell 4522 (quoted by Engler both under *Rh. glauca* and *Rh. scoparia*) ; Buffalo Bay, Knysna ; Duineveld, between the Kromme and Zitzikamma R., J. Sim 78 ; near Schoenmaakers Kop, Port Elizabeth, J. Sim 27 ; Walmer, Paterson 826 ; Humewood, Daly 1051 ; frequent near the Kasouga and Port Alfred, Britten 2108, 2295, 5015.

28. **Rh. africana** Mill. dict. n. 11 ; Sonder l.c. 517 p. pte ; Engler l.c. 414 p. pte ; Diels l.c. 574, 632 p. pte ; *Rh. mucronata* E. et Z. in Enum. 1129 (non Thunb.).

A curious mistake has been made in connection with this species. Under Ecklon 37 two different species have been distributed, one from Witsenberg, Tulbagh, is *Rh. cuneifolia* Thunb., the other (= E. et Z. 1129) is closely allied to *Rh. lucida*, with which it agrees in many characters, especially in the nature of the drupe, which is not described by Sonder in Fl. Cap. I, 517. Unfortunately, however, Plukenet's specimens in the British Museum leave a little doubt as to what is really meant by *Rhus africana*. There are two branches bearing this name which undoubtedly belong to two different species. The lower (without flowers and fruit) may be the plant which Sonder took to be his var. *macrophylla* of *Rh. africana* Mill. Next to it is a printed label bearing the words " type specimen ", and I have, therefore, taken it as the type.

Rh. africana Mill. E. et Z. 1129. **Upper side.**

DESCRIPTION : A low much branched shrub with densely pubescent branchlets. Leaves shortly petiolate, petioles at first pubescent, later often glabrous, short, canaliculate above, winged. Leaflets coriaceous, glabrescent or glabrous, sessile, obovate-cuneate, or oblong-cuneate, subobtuse, shortly plicato-mucronulate, margin slightly revolute, usually entire ; midrib and lateral veins raised on both surfaces, especially on the lower, tertiary veins not visible. Panicles axillary, puberulous, shorter or slightly longer than the leaves, pedicels very short. Calyx lobes ovate, petals oblong. Drupe as in *Rh. lucida*.

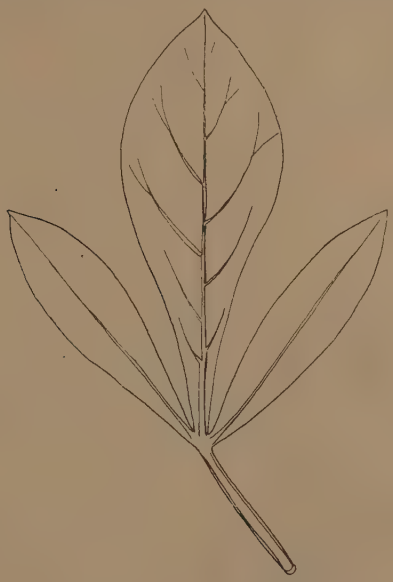
Length of petioles 8 mm. to 2·1 cm. ; terminal leaflets 4–6 cm. (rarely longer).
Breadth of terminal leaflets 2–3 cm.
Lateral leaflets about two-thirds the size of the terminal leaflets (or smaller).
Length of calyx lobes 1 mm. ; petals 2 mm.
Diameter of drupes about 4 mm.

DISTRIBUTION : From the Tulbagh division through Clanwilliam to the Van Rhynsdorp division (also in the Hex River Mts. ?), flowering in June, July, August.

Rocky places, Vogel Vley, 1,500 feet, Schlechter 7529 ; amongst heaths (alt. V), mountain sides near Brakfontein, Clanwilliam, E. & Z. 1129 ; summit of Heerelogement, Z. In specimens at Kew, collected at Els Kloof, Hex River, Wolley Dod 4044, the leaflets are crenato-dentate in the upper portion.

29. **Rh. albomarginata** Sond. l.c. 519, Engler l.c. 413, Diels 574, 632.

This species is allied to *Rh. lucida* (not *excisa* as Sonder said). It has large flowers. It is, as far as I know, not represented in any South African herbarium, and, although I know the places where it was found fairly well, I have never seen it growing.



Rh. albomarginata Sond. Burke in Herb., Kew.

DESCRIPTION : A glabrous shrub with angular compressed branchlets. Leaves petioled, petioles nearly half the length of the terminal leaflets, canaliculate above and margined. Leaflets slightly undulate, coriaceous, obovate-oblong-cuneate or the terminal subrhomboid

in the upper part passing into a narrow cuneate base, lateral oblong-cuneate, blunt or slightly acuminate, entire with thickened, white, slightly revolute margin; midrib comparatively broad in lower half, slightly prominent below, lateral veins slightly prominent below, slightly branched towards the margin. Panicles axillary, shorter than the leaves. Calyx lobes ovate, petals oblong-ovate. Drupe?

Length of petioles 1·5–2·5 cm.
Length of terminal leaflets 3–4 cm. Breadth of terminal leaflets 1–1·5 cm.
Lateral leaflets about two-thirds the length of terminal leaflets.
Calyx lobes about 1 mm. long (teste Engler). Petals about 2 mm. long (teste Engler).

Distribution: Only collected in the neighbourhood of Grahamstown, where, however, it must be very rare.

Herb. Kew: Slaay Kraal, Burke; Sidbury, 1,000 feet, MacOwan 749.

30. **Rh. scytophylla** E. et Z. in Enum. 1130: Sonder l.c. 517, Engler l.c. 412, Diels l.c. 574, 637, fig. 8 D.

Description: A shrub reaching a height of 6 feet with glabrous or puberulous branchlets. Leaves shortly petioled, petioles broadly margined. Leaflets coriaceous, sessile, obovate-oblong-cuneate, blunt or emarginate, sometimes mucronulate, usually entire, with slightly revolute margin, sometimes shining; midrib slightly prominent on the upper side, more so on the lower, lateral veins usually slightly prominent on both surfaces, sparingly branched in the upper part of the leaflets near the margin, tertiary veins not visible. Panicles multiflowered, lateral and terminal, puberulous, longer than the leaves, flowers pedicelled. Calyx lobes ovate, glabrous or minutely puberulous. Petals oblong. Drupe globose (teste Sonder "as in *Rh. lucida*").

Length of petioles usually 5 mm., but may reach 1·5 cm.
Length of terminal leaflets 2·5–4 cm. Breadth of terminal leaflets 1–1·5 cm.
Lateral leaflets about two-thirds the size of the terminal ones.
Length of pedicels 2–3 mm.; calyx-lobes about ½ mm.; petals about 1¼ mm.

Rh. scytophylla E. et Z. Z. 2247. Under side.

Distribution: On the mountains near Tulbagh, Stellenbosch, Caledon, and Swellendam, flowering from April to July.

Grietjesgat, near Palmiet R., E. & Z. 1130; Hottentots Holland, Z. 2247; Witzenberg, Pappe; Howhoek, 1,500 feet, Schlechter 7767, and the following in Herb. Kew: Z. 2246, Drège 6807*b*, Burchell 7835, 8662, 8033 (in the last many leaves are crenate-dentate at the apex).

31. **Rh. glauca** Desf. arb. II, 326; Thunb., Fl. Cap. ed. Schultes, 265; Sonder l.c. 516; Engler l.c. 411; Diels l.c. 573, 635; Marloth, Das Kapland 526.

Rh. Thunbergiana Roem. et Schult. Syst. Veg. VI, 657; *Rh. lucida* E. Mey. in Drège exsicc. (non Linn.).

Description: An unarmed glabrous shrub with subangulate branches more or less covered with resin, which eventually dries and becomes grey. Leaves petioled, resinous or, when the resin dries in summer, covered with a grey powder, petioles canaliculate above, slightly winged. Leaflets sessile, terminal usually obcordate-cuneate, lateral obovate or obcordate, sometimes plicate-mucronulate; midrib and lateral veins (which are often minutely wavy) slightly raised above and below, tertiary veins not visible. Panicles terminal and lateral much branched, two to three times longer than the leaves, flowers pedicelled. Calyx lobes ovate. Petals oblong. Drupe globose, shining, reddish.

Length of petioles 8–12 mm.
Length of terminal leaflets 1·5–2 cm. Breadth of terminal leaflets 1–1·2 cm.
Lateral leaflets about two-thirds the size of the terminal ones (sometimes less).
Length of pedicels 1–2 mm.; calyx lobes ½ mm.; petals 1½ mm.
Diameter of drupe about 5 mm.

Sometimes the number of leaflets in some leaves is reduced to one or two, sometimes increased to four.

Rh. glauca Desf. Herb. Thunberg.

Distribution: On mountains and hills in south-west Cape Colony and on sand-dunes, extending eastwards to Grahamstown, Queenstown, and East London,* flowering generally in winter and fruiting about September.

Herb. Thunberg; Burchell 378; Piquetberg 400 feet, Schlechter 7895; Darling, Malmesbury division, Bachmann 377; Cape Peninsula, E. et Z. 1120 (*Rh. Thunbergiana* Roem. et Schult. ex E. et Z. Enum.), E. et Z. 1121, Wilms 3124, Diels 2, 1273, Drège 116*d*, E. & Z. 34, Engler 114, Schlechter 1007; Caledon, E. & Z.; Genadendal, 800 feet, Schlechter 10331, 10332 (leaflets more elongate than usual); Knysna heads, Keet 1029, Schonland 3528; Belvidere, Knysna, Duthie 663; the Glebe, Knysna, Phillips 159; Duineveld, between Slang and Kromme R., 6–8 feet, common sand-stay, J. Sim 9, Phillips 1610; coastal and dune area near Schoenmakerskop, Port Elizabeth, J. Sim 23; Humewood, Paterson 3362; Grahamstown, near Golf Links, Gane 15, Bowker's Park, near Queenstown, Hilner 313. Drège 116*b*, which belongs here, was marked at Kew "*Rh. lancea* Desf. ex Presl Bem. 41."

Z. 2241 (evidently = E. et Z. 1120) was named *Rh. Thunbergiana* R. et S. and *Rh. plicaefolia* Z., but is not *Rh. plicaefolia* E. et Z. 1118.

Specimens collected by Dr. Meyer in 1869 in the Hantam mountains are marked "forma ad excisam spectans". I doubt whether they belong here.

Specimens of Sieber, Fl. Cap. 218, in the Berlin Herbarium, marked "*typus Rh. glauca* (*Rh. Thunbergiana* R. et Sch.)", have mostly obtuse, obovate, cuneate leaflets.

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* This may have to be modified as in the absence of fruits of many of the specimens examined I am unable in some cases to say for certain whether they belong to *Rh. glauca* Desf. or *Rh. undulata* Jacq. Those from inland localities especially are doubtful. In old collections *Rh. glauca* is often named *Rh. lucida* L.

32. **Rh. undulata** Jacq. in Hort. Schoenbr. t. 346 ; Sonder l.c. 518 ; Engler l.c. 410 ; Diels l.c. 573, 594, 632.

Rh. excisa Thunb., Fl. Cap. ed. Schultes 264 ; Drège exsicc. ; E. et Z. 1125.
Rh. nervosa E. et Z. (non Poir.) in Enum. 1115.
Rh. pallens E. et Z. in Enum. 1114.
Rh. plicaefolia E. et Z. in Enum. 1118.
Rh. spathulata E. et Z. in Enum. 1119.
Rh. aglaeophylla E. et Z. in Enum. 1117.
Rh. micrantha E. et Z. in Enum. 1124 (non Thunb.).
Rh. mucronata E. Mey. in Drège exsicc. (non Thunb.).
Rh. celastroides Sond. l.c. 519 ; Engl. l.c. 417 ; Diels l.c. 576, 628.
Rh. Burchellii Sond. in Engl. l.c. 412 ; Diels 574, 633, fig. 7 G.
Rh. Rangeana Engl. in Pflanzenwelt Afrikas III, II, 205, fig. 101 A–E.
Rh. vernicata Schlecht. ib. 205.
Rh. Galpinii Engl. (non Schinz) ib. 208.

Description : A very variable, usually unarmed shrub, glabrous except young leaves, which may be puberulous, often reaching a height of 15 feet in the coast districts, and then main branches reaching a thickness of 8–9 inches. Branchlets slightly angular. Leaves petiolate, petioles winged, particularly in the upper part. Leaflets often covered with a resinous excretion, membranous or (in the arid parts of South Africa) subcoriaceous or coriaceous, cuneate-oblong, obovate-oblong, obtuse, acute or emarginate, often plicate-mucronulate, margin entire or rarely irregularly dentate or rarely crenate ; midrib slightly prominent on both surfaces, lateral veins delicate but distinct, tertiary veins not visible. Panicles lax, axillary usually shorter than the leaves, terminal somewhat longer. Calyx segments ovate. Petals oblong. Drupe glabrous, compressed, often remaining green when ripe.

Length of petioles 1·2–2·2 cm. (in var. *celastroides* and *Burchellii* smaller).
Length of terminal leaflets 3–5·5 cm. (in var *celastroides* and *Burchellii* smaller).
Breadth of terminal leaflets usually 1–1·3 cm. (in var. *celastroides* and *Burchellii* smaller).
Lateral leaflets one-half to two-thirds of terminal leaflets.
Length of calyx lobes about $\frac{1}{2}$ mm. ; petals $1\frac{1}{4}$–$1\frac{1}{2}$ mm.
Greatest diameter of fruit about 3 mm.

1. *Rh. undulata* Jacq. Herb. Jacquin.
2. *Rh. undulata* Jacq. Herb. Jacquin (teeth of obovate leaflet enlarged).
3. *Rh. undulata* Jacq., var. *Burchellii* Schonl. Burchell 1722.
4. *Rh. excisum* Thunb. Herb. Thunberg (very close to *Rh. undulata* Jacq. var. *celastroides* Schonl.).

Distribution: In the coast districts from Damaraland to Natal and in the dry interior of the Cape Province, southern Bechuanaland, Orange Free State, and the Transvaal, having adapted itself to a wide range of climatic conditions. It flowers mainly in the late summer and autumn.

Rh. undulata Jacq. is represented in Herb. Jacq. at Vienna (but without flowers and fruits). The leaves vary in size and shape. The terminal leaflet may be from 4–6½ cm. in length. The leaflets in the type specimens are obovate, oblanceolate, obtuse or subacute. Their margins are slightly undulate or in some leaflets irregularly dentate. Some leaves are indistinguishable from *Rh. excisa* Thunb., with the type of which I have compared them (*Rh. excisum* fol. β in Herb. Thunberg, Upsala). Sonder (l.c. 519) says that it differs from the preceding by the three times smaller, not undulate or incised-toothed leaflets. Already Engler (l.c. 411) had stated with reference to *Rh. excisa*: "Valde affinis *Rh. undulatae* et vix nisi foliis paullo crassioribus supra haud resinosis integris diversa". Diels (l.c. 573) states that these distinctions do not hold good, and I agree.

Thus *Rh. excisa* Thunb. is best sunk in *Rh. undulata* Jacq. Both have compressed fruits which distinguish them from *Rh. glauca* Thunb.; their leaves, however, sometimes approach the latter in shape, texture, and size. Typical *Rh. undulata* (incl. *Rh. excisa*) occurs in the southern coast districts of South Africa. Already in these the leaflets may retain on their surfaces a copious supply of resin. This is often more decided in the more arid interior parts. At the same time the leaves become smaller in size. There is a bewildering number of forms; the most decided ones are those which have been placed by various authors under *Rh. celastroides* Sond. (l.c. 519) and *Rh. Burchellii* Sond. (in Engl. l.c. 412). Extreme forms of these are easily distinguished, but I have failed to separate them satisfactorily when large series of specimens were examined. I, therefore, place them as varieties under *Rh. undulata*. A number of other forms described without sufficient reason as separate species will be mentioned presently.

A. *genuina*.—Leaflets membranous, terminal usually about 3–5 cm. long.

α forma *undulata*.—Leaflets not conspicuously resinous, obovate-oblong or obovate, cuneate at the base, apex obtuse or acute rarely deeply emarginate, margin entire, undulate, undulate-denticulate, dentate or rarely crenate.

β forma *excisa*.—Leaflets not conspicuously resinous, entire or emarginate at the apex, narrowly obovate-oblong or obovate-lanceolate, often plicate-mucronulate.

γ forma *contracta*.—Leaflets similar to β, but very resinous. Lateral branches often contracted, sometimes turning into thorns (*Rh. vernicata* Schlecht.).

B. *celastroides* (*Rh. celastroides* Sond.).—Leaflets subcoriaceous, usually conspicuously resinous, smaller than in var. A, generally very acute. Plants of squarrose habit, often thorny. (In the type, Z. 233, the leaflets are mostly lanceolate, acuminate, undulate, but some are oblanceolate, obtuse, with or without a mucro. There are no tangible floral or fruit characters that can be used to distinguish it from var. A). Only found in arid parts.

C. *Burchellii* (*Rh. Burchellii* Sond., *Rh. Rangeana* Engl.).—Leaflets coriaceous, shining, rarely slightly exceeding 1 cm. in length, often much smaller, obcordate-cuneate, much contracted in the lower half, entire or rarely more or less crenate near the apex. Plants sometimes thorny. Only found in arid parts.

A. *genuina* α *undulata*.

Herb. Jacquin, Vienna; Drège 5889; Piquetberg, Diels 190; Olifants River valley, west of Clanwilliam, Diels 1149; ib., on sandhills, Diels 228; Van Rhynsdorp, about 1,000 feet, Diels 558; Darling, Gürke 609; Saron, Schlechter 7782 (in the two last, as in some others, the leaflets are obovate and bluntly crenate in the upper part); Calvinia, Rijsjoen mountain, Marloth 10300; Heerelogement, E. & Z. 338; expedition to the Khamiesberg, Giftberg, and Olifants River, 1–2,000 feet, Phillips 7528; amongst shrubs east side of Table Mountain, near Constantia, E. & Z. 39, 1124 (*Rh. micrantha* E. et Z. non Thunb.); mountains above Worcester, Rehmann 2517 (with larger leaves than usual, probably a coppice shoot);

Worcester, hills opposite station, Marloth 9952 ; Robertson, base of foothills, De Hoop Road, Britten 653 ; Phisantefontein, Kl. Karroo, Muir 2477 ; hills south of Matjesfontein, Pearson 2967, Rehmann 2912 ; Prince Albert, Marloth 11277 ; near Laingsburg, Marloth 3972 ; Ceres, Karroo, Marloth 10472 ; slopes of Bokkeveld, 400 m., Marloth 7796 ; Wupperthal, Marloth 7502 ; hills near Genadendal, Schlechter 10331 ; Groot River Hill West, Zitzikamma, Fourcade 1238 ; Cango Kopje (Oudtshoorn), near hotel, frequent, Britten 1730 ; Baakens River valley, Port Elizabeth, J. L. Drège 533 ; Port Elizabeth, James 3 ; Natal, Wood 9340. Cultivated specimens ex hort. Paris 1823, in the Berlin Herb., agree well with Jacquin's types as well as some of Diels' specimens.

The following has small entire leaflets and relatively long petioles which are broadly winged (the broadness of the wings, however, varies in Jacquin's types). The average length of the petioles is 1·2 cm. of the terminal leaflets 1·3 cm. The leaflets are broadly oblanceolate, obtuse, rarely emarginate : Klipfontein, Namaqualand, c. 3,100 feet, Bolus 9504. Some specimens of Sieber, Fl. Cap. 154, agree closely with this.

A. *genuina β excisa.*

Herb. Thunberg ; Nieuwe Hantam, Drège 6408*b* and 6809 p. pte. ; Drège 5589 ; Calvinia, common on south-east slope of the Roupmyniet, 900–1,000 feet, Diels 666 ; Tulbagh, Worcester, and Clanwilliam, E. et Z. 1125 ; rocky places near Ladismith, Marloth 2989 ; hills near Mossel Bay, Schlechter 5725 ; Glebe, Knysna, Phillips 15 ; Knysna heads, Keet 1029, Schonland 3528 ; Belvidere, Knysna, Duthie 663 ; Plettenberg Bay, 10 feet, Schlechter 5932 (terminal leaflets only 1·5–2 cm. long) ; Hankey, Paterson 20 ; karroid places between the Zwartkops and Sundays Rivers, Z. 2243, E. & Z. 1118 (*Rh. plicaefolia* E. et Z., *Rh. excisa γ emarginata* Sond.—E. & Z. remark : " Folia valde variant ") ; Uitenhage and Addo, 50–500 feet, E. & Z. 1115 (*Rh. nervosa* E. et Z. non Poir.—has slightly thicker leaflets than the preceding ones. The growth is more fastigiate) ; Earnecliff, Port Elizabeth, 100 feet, Galpin 6378 (this agrees well with *Rh. nervosa* E. et Z. ; such forms closely approach var. *celastroides*) ; amongst shrubs on the Zwartkops River, E. & Z. 1119 (*Rh. spathulata* E. et Z.) ; Zwartkops River and Addo, E. & Z. 39, 1114 (*Rh. pallens* E. et Z., *Rh. excisa β pallens* Sond.) ; in scrub near Uitenhage, Schlechter 2521 ; along the Bushmans River, Alicedale, Schlechter 2706 ; Bothas Hill, Grahamstown, E. & Z. 39, 1117 (*Rh. aglaeophylla* E. et Z.) ; very common in open bush (except in karroid places) on the Zuurberg range, Grahamstown, e.g. E. & Z. 406, Britten 1503, 1524, 1533, 1555, 1571, 2739, Gane 66, 325, MacOwan 504, Rogers 27711, Dyer 59, 60 ; Bathurst, Nell (5157) ; Kowie West, Britten 5016 ; Bedford, Nicol 78 ; Katberg, about 4,000 feet, Staples (5022*a*) ; Wolfridge, Amatolas, Hunter ; Keiskama hoek, Dawson (5073) ; Kingwilliamstown, Schlechter 6128 ; Windvogelberg, near Cathcart, 3,500 feet, Baur 1119 ; Queenstown, 6,000 feet, Galpin 2142 (*Rh. Galpinii* Engl. non Schinz, approaches *Rh. glauca* in the shape of the leaflets) ; East London, Gane 312 ; Komgha, Flanagan 320, 799 ; Bazija, Transkei, Baur.

A. *genuina γ* contracta.

Hills at I'Us (Western Region), Schlechter 11434 ; Queenstown, Rogers ; in bush near Kingwilliamstown, 1,500 feet, Tyson 2100 ; near the Kabousie River, Komgha, 2,000 feet, Flanagan 701.

B. *celastroides—Rh. celastroides* Sond.

Namos, Bechuanaland, Z. 233 ; Karreebergen, Schlechter 8196 ; Little and Great Namaqualand, Pearson 5728, 3946, 3418, 3341, 3964, 4960, 3761, 2978, 4220.

C. *Burchellii—Rh. Burchellii* Sond., *Rh. Rangeana* Engl.

At the confluence of the Vaal and Orange Rivers, Burchell 1722 ; Basutoland, Cooper 2172 ; Leribe, 5–6,000 feet, Dieterlen 581 ; Bloemfontein, Rehmann 3800, 3887 ; Elandshoek, near Aliwal North, Bolus 10487 ; near Burghersdorp, Flanagan 1532 ; Conway farm, Galpin 5516 ; Honey Nest Kloof, Wilman 1522 ; mountain ravines near Murraysburg, Tyson 296 ; on rocks amongst hills, Leeuwfontein, 2,600 feet, Pearson 3228 ; common in Namaqualand and the South-West Protectorate, e.g. Pearson 3801, 5728, 8203, 3174, Dinter 1134, 1134*a*, Schäfer 168, 236, Engler 6699, 6763, Blank 70, Range 125, 227, 1765, Marloth 4655.

Blank notes that the natives eat the fruit which may indicate that it is more juicy than in var. A.

While the specimens enumerated above can, on the whole, fairly easily be sorted out as belonging to different varieties and forms, I have seen a large number of others which I cannot readily assign to these varieties, yet I do not think it advisable at present to place them under special named varieties or forms. The difficulties encountered may be illustrated by Bolus 88, collected in a kloof on a mountain side near Graaf-Reinet, alt. 3,500 feet, with flowers and young drupes.

This is quoted by Engler (l.c. 411) under *Rh. excisa* Thunb. *β pallens* Sond. It is sufficiently distinct from *Rh. pallens* E. et Z. 1114 to prevent us from placing it with it. Its leaflets vary in length from 7 mm. to 2·8 cm.; they are either slightly or decidedly "varnished"; they are usually obovate-cuneate or broadly oblong-cuneate, rarely obovate. The cuneate lower portion narrows, either gradually or somewhat suddenly. The apex is entire, obtuse or acuminate or mucronate, rarely emarginate or crenate. The petiole is either slightly margined or distinctly winged. Other forms placed under var. *pallens* Sond. in Herb. Kew and Berlin show so much diversity that again one cannot find any tangible characters to keep them separate, e.g. Burchell 2850, 2871, 2991, 4214, 4726, Drège (named *Rh. mucronata* Thunb.), MacOwan 504 from Grahamstown, Marloth 10347 from Beaufort West, Bolus 5290 from Mitchell's Pass.

The following belonging to *Rh. undulata* cannot, without re-examination, be placed by me under any of the varieties here constituted: Waterval Onder, Lydenburg district, Burtt-Davy 396.

There can, further, be no doubt that this species sometimes hybridizes with others. Perhaps Paterson 3362, collected at Humewood, near Port Elizabeth, is such a hybrid. It has puberulous branchlets.

ECKLONIANA group.

33. **Rh. eckloniana** Sond. l.c. 515; *Rh. tridactyla* E. et Z. in Enum. 1095 (non Thunb.); *Rh. angustifolia*? *α* Thunb. herb.; *Rh. margaretae* Burtt-Davy Ms.

Rh. Schoenlandii Engl. in Pflanzenwelt Afrikas III, 2, 215 (Daly and Gane 747).

Description: A usually glabrous dwarf shrub, rarely over 2 feet in height, with purple angular branchlets. Leaves petiolate. Petioles subterete, furrowed above. Leaflets sessile, often more or less folded along the midrib, oblong or lanceolate-oblong, often mucronate, cuneate at the base, margin entire, slightly thickened and often white when dry. Midrib sunk above, very prominent below, lateral veins subparallel, slightly branched towards the margin, very slightly prominent below, tertiary veins inconspicuous. Panicles lateral in the upper portions of the branches and terminal equal in length to the leaves or slightly shorter or longer, rather lax. Bracts small subulate. Calyx segments ovate, bluntish. Petals oval. Drupe shiny, glabrous, subglobose.

Rh. eckloniana Sond. Dyer 4601. Under side. (Leaflets often folded along midrib.)

Petioles 1–2 cm. long.
Terminal leaflets 1·5–3·8 cm. long, 5–10 mm. broad.
Lateral leaflets ½ to ¼ shorter.
Pedicels about 1–2 mm.; calyx-segments about ¾mm.; petals 1½–2 long.
Drupe 5·5–6 mm. in diameter.

DISTRIBUTION: From the Elands River, in the Uitenhage division, to Bothas Hill and Blaauwkrantz, near Grahamstown, also Roundhill, chiefly on dry ridges, flowering chiefly in the late summer and fruiting in winter, Orange Free State and the Transvaal.

Ecklon 310, Z. 2230, Cooper 2173, 1538, Bolus 10638, Daly and Gane 747, Rogers 3108, Galpin 2906, Britten 2767, 5160, Baur 1092 are typical *Rh. eckloniana* from south-eastern Cape Province. E. et Z. 1095 are cultivated specimens, wrongly distributed as *Rh. tridactyla* Burch. Drège's specimens were distributed as *Rh. laevigata* L. *fol. long. integra* E. Mey. *b.*—There is a slight resemblance to the genuine *Rh. laevigata* L. (non Thunb.) in shape of leaflets, inflorescence, etc., but the venation of the leaflets is different.

Many of the Transvaal specimens are more or less pubescent, or even in young portions subvillous (*Rh. margaretae* Burtt-Davy), e.g. Schlechter 3539, Moss 2957, Gilfillan in Herb. Galpin 1495, but the following are quite glabrous: Galpin 1495, Burtt-Davy 15138 (=15060), Schlechter 3539*a*, Keet 5166 in Herb. Alb. Mus. These last range from Parys (O.F.S.), Vereeniging to Barberton, and cannot be distinguished from typical *Rh. eckloniana.*

In various specimens it was found that the number of floral parts was increased to six or seven.

34. **Rh. Engleri** Britt. in Journ. of Bot. XXXVIII, 1900, 316.
Rh. incana Engl. l.c. 420 (non Mill.); Diels l.c. 581, 630.

DESCRIPTION: A much branched shrub or small tree, about 12 feet high, with spreading sometimes spinescent branches. Branchlets short, terete, the young ones densely greyish pilose. Leaves petiolate, petioles, subsemiterete, furrowed above, sometimes slightly winged, greyish pilose. Leaflets membranous, sessile, oblanceolate, obtuse or emarginate, margin often slightly revolute, entire or slightly crenato-dentate, upper surface dull green with puberulous midrib, and sometimes the lateral veins slightly prominent and greyish pilose, lower surface greyish pilose, the midrib and the few lateral veins somewhat prominent. Panicles lateral and terminal, pilose, laxly flowered, equal to or twice the length of the leaves. Bracts minute. Calyx lobes oblong, triangular. Petals yellowish, oblong. Drupe somewhat asymmetrical, laterally compressed and often umbonate on one side of the apex, brown, glabrous, shining.

Length of petioles 8–10 mm.
Length of terminal leaflets 2·5–3·5 cm. Breadth of terminal leaflets 6–7 mm.
Lateral leaflets usually about two-thirds the size of the terminal, sometimes shorter.
Length of pedicels 1–2 mm.; calyx lobes about ¾ mm.; petals 1½ mm.
Greatest diameter of drupes about 3 mm., height about 4 mm.

Rh. Engleri Britt. Galpin 2919. Under side.

DISTRIBUTION: Transvaal Bushveld (Rehmann), Naboomspruit, Wakkerstroom, Waterberg district, Potgietersrust, Rooikop.

Rehmann sine no; Rogers 19004; Galpin 8472, M 64; Leendertz 1147, 1500, Pole Evans 2930, Baily 933.

The fruit is similar to that of *Rh. Marlothii* Engl., but its affinities generally seem to be with the species with which it is associated here. Engler places it next to *Rh. Welwitschii*, an Angolan species, and close to *Rh. divaricata* E. & Z. The latter has longer petioles, longer petals, different fruit, etc.

Mr. E. E. Galpin gives the following notes on some of his specimens:—

Locality: Farm Roodepoort, Springbok Flats, 8 miles south-east Naboomspruit Station, Altitude 3,750 feet.

Nature of Ground, etc.—Typical Springbok Flats red heavy loam derived from amygdaloidal basalt. On level plains in Sweet Acacia veld. In small bush clumps associated with *Acacia Karroo, Acacia litakunensis, Acacia robusta, Euclea lanceolata*, and *Ehretia hottentotica*, etc. Frequent.

Average height 12 feet. Stem 4–6 inches diameter.

Wood red brown and fairly tough. Used occasionally for pick-handles, but not nearly so good as that of *Rhus incana* [—this should be *pyroides*.—S. Sch.].

Local name Karaa, as distinguished from Karee the name for *Rhus lancea*.

Sesuto name Mphapashane, which is also applied to *Rhus Gueinzii*. Very frequently attacked by hairy caterpillars, by which many trees are completely defoliated every year.

35. **Rhus eburnea** Schonl. n. sp.

DESCRIPTION: Frutex fastigiatus $1\frac{1}{2}$–$1\frac{3}{4}$ m. altus ramulis teretibus adscendentibus pubescentibus, foliis petiolatis, petiolis pubescentibus supra canaliculatis foliolis terminalibus brevioribus; foliolis supra saturate viridibus infra pallidioribus utrinque sparse pilosis lanceolatis vel oblongis basi cuneatis apice acutis vel acuminatis margine integris costa supra canaliculato infra valde prominenti nervis parce ramosis distinctis sed immersis; paniculis laxis axillaribus et terminalibus quam folia longioribus rarius brevioribus, bracteis floriferis minutis, floribus pedicellatis, calycis segmentis acutis petalis oblongis subtriplo brevioribus, drupa subglobosa eburnea exocarpo coriaceo.

Petioles about 1 cm. long.
Leaflets: terminal ones about 2·5 cm. long; lateral one-third to one-half shorter, 6–8 mm. broad.
Panicles 3–4·5 cm. long. Floral bracts about $\frac{3}{4}$ mm. long. Pedicels usually 2 mm. long.
Calyx segments about $\frac{1}{2}$ mm. long. Petals about $1\frac{1}{4}$ mm. long.
Drupe about 3 mm. in diameter; about $3\frac{1}{2}$ mm. high.

The yellowish white drupes usually show a few reddish thin irregular lines and bear at the apex a small black remnant of the styles.

Rh. eburnea Schonl. Keet 1547. Upper side.

DISTRIBUTION: Eastern Transvaal at an altitude of 2,500 to 4,000 feet.

Keet 1547—Marieskop forest reserve, Pilgrims Rest district (formerly Lydenburg), Dec. (fl., fr.).

Mr. Keet writes: "The bush forms one of the chief constituents of the 'fynbos' on the edge of the forests and generally along foothills and slopes from 2,500 to 4,000 feet, being mixed usually with a species of *Euclea*, a sp. of *Royena*, and with *Cliffortia linearifolia*. It is found on all aspects and on soil from both granite and sandstone formations. The reserve is situated about 30° 40′ East and 24° 30′ South."

The vegetative organs resembles those of *Rh. eckloniana* (*Rhus margaretae* Burtt-Davy), but the fruit is different, the panicles longer in *Rh. eburnea*, etc.

NATALENIS group.

36. **Rh. natalensis** Bernh. in Krauss Beitr. (1844) 46; Sonder l.c. 515; Engler l.c. 421; Diels l.c. 587, 631; *Rh. glaucescens* A. Rich. Tent. Fl. Abyss. I, 143; *Rh. crenulata* A. Rich. Tent. Fl. Abyss. I (1847) 142; *Cissus natalensis* Bernh. in sched.

Description: A glabrous shrub 8–10 feet high with greyish subterete branchlets. Leaves petiolate, petioles broadly canaliculate above. Leaflets subcoriaceous, dark green above, light green below, broadly oblong, cuneate at the base, obtuse or emarginate at the apex; margin crenate-dentate, or subentire, rarely entire, slightly revolute; midrib prominent on both surfaces or sunk on the lower, lateral veins slightly prominent or immersed, tertiary veins immersed, reticulate, barely visible as a rule. Panicles axillary, often smaller than the leaves, lax. Flowers greenish yellow, calyx segments ovate, petals oblong. Drupe glabrous, yellowish brown, a little compressed and depressed.

Length of petioles 1–2 cm.
Length of terminal leaflets 4·5–5 cm. Breadth of terminal leaflets 1·8–2·3 cm.
Lateral leaflets nearly three-quarters the size of the terminal.
Length of calyx segments ½ mm.; petals 1·5 mm.
Greatest diameter of drupe 5–6 mm.

Rh. natalensis Bernh. Schonland 4025. Under side.

Distribution: From about 11 miles west of East London along the coast to the borders of the Tropics, and widely spread in Tropical Africa to Abyssinia, and varying there to a considerable extent, but a number of specimens placed in European herbaria under *Rh. glaucescens* Rich. should be excluded; in many others the material is quite insufficient to allow of exact determination.

Diels has associated this species with *Rh. crenata* Thunb. in his *Crenata* group (l.c. 630) characterized (l.c. 597) by " crenate leaflets with glands predominating ". While there is no decisive evidence against this procedure, I do not think it advisable to follow it. He placed the closely allied *Rh. Marlothii* into his *Damarensis* group (l.c. 627), the characterization of which (l.c. 597), to my mind, is the same as that of the *Crenata* group (" Crenate leaflets. Indument strongly inclined towards reduction ").

Port Natal, Krauss 395 in Herb. Kew ; Overton in forest 11 miles west of East London, Hilner 281 ; Port St. Johns, in bush near beach, Schonland 4025 ; Embotye, Pondoland, near sea-level, Fraser 73/15/A (5101), 37/38/A (5154), (5088) ; Durban, from near sea-level to 100 feet, Wood 8729, 1713, 1136, Gueinzius, Rudatis 1481 ; Moss and Rogers 1708 (labelled " above Kirstenbosch, Cape ", which is evidently a mistake).

37. **Rh. Simii** Schonl. n. sp.—*Rh. glaucescens* Sim (non Rich.) in " Forests and Forest Flora of South Africa " (1907) 195, t. 49, fig. 1.

Description : Frutex divaricatus inermis vel spinosus vel arbor parvus ramis griseis, ramulis pubescentibus ; foliis petiolatis petiolis gracilibus subteretibus supra canaliculatis foliolis brevioribus ; foliolis rigide membranaceis oblongis vel lanceolatis basi angustatis obtusis rarius emarginatis margine leviter incrassatis integris vel ± crenato-serratis supra glaucis subtus pallide rufescentibus costa utrinque prominenti nervis utrinque leviter prominentibus marginem versus integris vel furcatis et connatis, venis paucis vel nonnullis ; paniculis pubescentibus foliis brevioribus ex axillis foliorum superiorum et terminalibus subdensifloris ; floribus pedicellatis calycis segmentis ovatis subacutis extus parce puberulis petalis oblongis calyci subtriplo longioribus, disco in floribus masculis 5-crenato ; drupa subglobosa nitida.

Length of petioles 2–2·5 cm.
Length of terminal leaflets usually 5–6 cm. Breadth of terminal leaflets about 1·3 cm.
Lateral leaflets not quite two-thirds the length of the terminal ones, but often broader than these.
Length of calyx segments $\frac{1}{2}$ mm. ; petals $1\frac{1}{2}$–$1\frac{1}{2}$ mm.
Diameter of drupe about 3·5 mm.

Rh. Simii Schonl. Sim 2127. Under side.

Distribution : Woods at Toise River and Komgha, flowering in autumn, and Komati Poort (var. *lydenburgensis* Schonl.).

Sim remarks that this species varies considerably in leaf-form and sometimes resembles wide-leaved forms of *Rh. lancea*. Its wood is sometimes used for hoe-handles as it is light and tough.

Sim includes in this *Rh. Gueinzii* Sond., which is not justified. Its affinities are with *Rh. natalensis* Bernh., which differs from it in many vegetative characters and has larger fruits. It may perhaps have to be sunk in *Rh. spinescens* Diels.

Toise River, 3,500 feet, Sim 2127; Komgha, Flanagan 797.

var. *lydenburgensis*.—This has the same fruit as the type, but differs from it in the following characters: Leaflets green and more thickened at the margin. The thicker branches armed with short thorns. Common in the low veld at Komati Poort, 600–700 feet; also grown in hedges, Keet 1431 (5158).

I append a full DESCRIPTION as it may have to be separated as a distinct species or united with *Rh. spinescens* Diels:—

Frutex divaricatus spinosus, ramis adultis spinis crassis ad 6·2 cm. longis armatis, ramulis brevissime pubescentibus subangulatis; foliis petiolatis, petiolis gracilibus subteretibus supra leviter canaliculatis foliolis brevioribus, foliolis glaberrimis rigide membranaceis oblongis basi angustatis obtusis rarius emarginatis margine incrassatis breviter crenato-serratis supra saturate viridibus subtus pallidioribus costa utrinque prominenti nervis supra immersis vel leviter prominentibus subtus leviter prominentibus±ramosis; paniculis laxifloris lateralibus et terminalibus foliis brevioribus; floribus ignotis; drupa subglobosa nitida.

Length of petioles c. 2·5 cm.
Length of terminal leaflets up to 5·8 cm., rarely much shorter.
Breadth of terminal leaflets about 1·3 cm.
Length of lateral leaflets 3–3·5 cm.
Diameter of drupe 2–2·25 mm.

38. **Rh. spinescens** Diels in Engl. Bot. Jahrb. XL (1907) 87.

DESCRIPTION: A shrub about 8 feet high, with pale branches, the lateral often thorny, branchlets greyish pubescent. Leaves petioled, petioles slender, semiterete, canaliculate above, very sparingly pilose. Leaflets papery, glabrous or on the veins very rarely a little hairy, above deep green, below pale glaucous, oblong or oblanceolate, margin very narrowly revolute, subundulate, midrib slightly prominent on both surfaces, secondary veins distinct, but not raised, tertiary veins not visible. Panicles densely pubescent with whitish hairs, shorter than the leaves. Calyx segments broadly ovate, truncate, glabrous, petals ovate, obtuse. Drupe (in Keet 1493) subglobose, glabrous, shining, brown, slightly depressed, sometimes retaining the styles.

Rh. spinescens Diels. Schlechter 11791. Under side.

Length of petioles 1–1·5 cm.
Length of terminal leaflets 3–3·5 cm. Breadth of terminal leaflets 8–10 mm.
Lateral leaflets nearly two-thirds the length of terminal.
Length of calyx segments ½ mm.; petals 1·2–1·5 mm.
Diameter of drupe 4 mm.

Distribution: Komati Poort, common in the low veld.
This species is closely allied to *Rh. Simii* Schonl.

Komati Poort, Schlechter 11791; ib., common in low veld, Keet 1493.

39. **Rh. Marlothii** Engl. in Bot. Jahrb. X, 37, Pflanzenwelt Afrikas III, 2, fig. 182; Diels l.c. 581, 627.

Description: An unarmed shrub with minutely puberulous or shortly pilose branchlets. Leaves petioled, petioles sulcate above, puberulous or pilose. Leaflets subcoriaceous, puberulous or pilose, obovate-oblong or oblong, cuneate at the base; margin in the upper part slightly crenate; midrib prominent on the lower surface, lateral veins delicate, more or less immersed, tertiary veins not visible. Panicles at the end of the branchlets, axillary shorter than the leaves, terminal usually a little longer, puberulous, lax. Calyx segments puberulous, ovate, petals oblong. Drupe glabrous, shining, distinctly compressed, very often somewhat asymmetrical and sometimes crowned by the hardened subcuspidate styles.

Length of petioles 5–12 mm.
Length of terminal leaflets 2·1–4·5 cm. Breadth of terminal leaflets 1–1·8 cm.
Lateral leaflets about two-thirds the size of the terminal.
Length of calyx segments ½ mm.; petals 1¼ mm.
Greatest diameter of drupe about 4 mm.

Rh. Marlothii Engl. Marloth 1394. Under side.

Distribution: South-West Protectorate, Bechuanaland Protectorate, Transvaal. It flowers in summer.

This species is clearly allied to *Rh. natalensis* and not to *Rh. crenata* Thunb. as Engler thought. In its fruit it may approach *Rh. populifolia*. On the other hand, it also approaches *Rh. Gerrardi*, and thus forms a connection with the *Lancea* group. It is a somewhat variable species. Engler has indicated a var. *robusta* (Dinter 1711 = *Rh. tsemubensis* Dinter in Herb. S.A. Mus.) and a var. *subintegra* (Dinter 691, etc.), but I find that the length of the leaflets, their more or less pronounced crenation and the amount of their hairiness cannot be used to establish even fairly well-defined varieties. In Dinter 69 it was noticed that the rudimentary stamens in the female flowers remain even when the fruit is ripe.

Otyimbingue, Hereroland, c. 2,700 feet, Marloth 1394; river scrub, Bullspoort, Dinter 2712 (leaflets smaller than usual); Wilhelmsburg, near Okohandja, Dinter 69; other specimens from South-West Protectorate: Engler 6469, Hartman 217, Waibel 50, 50*b*, Dinter 347, 1711, Fritsch 24, 130, and the following which would fall under Engler's var. *subintegra*: Dinter 691, Engler 6219, 6302, Seiner 835, Fritsch 63; Mochudi, Rogers 6628, Pietpotgietersrust, Bolus 1021 and Burtt-Davy 2205 (*Rh. Engleri* var. *fulvescens* Burtt-Davy).

40. **Rh. commiphoroides** Engl. et Gilg in Warb. Kunene-Sambesi Exped. 289.
Rh. kwebensis N.E. Br. in Kew Bull. 1909, 100.

Description: A much branched shrub up to 7 feet high with greyish, densely pilose branchlets. Leaves petiolate, petioles densely pilose, subterete, slightly channelled above. Leaflets subcoriaceous, glaucous, paler on the under side, pubescent on both sides, ovate or obovate or elliptic-oblong, cuneate at the base (the terminal often much contracted),

obtuse at the apex; margin flat, coarsely crenate or bicrenate, except in lower portion of the leaflets, which is entire; midrib and lateral veins generally depressed on upper surface, prominent on the lower, tertiary veins finely reticulate, inconspicuous. Panicles lateral and terminal, pubescent, multi-branched with clusters of pedicelled flowers. Calyx segments ovate, obtuse, petals oblong. Drupe (in Dinter 2874) glabrous, subglobose, slightly depressed and compressed, whitish when ripe.

Length of petioles 1–1·3 cm.
Length of terminal leaflets about 5 cm. Breadth of terminal leaflets about 3 cm.
Lateral leaflets about half the size of the terminal leaflets and generally barely cuneate at the base.
Length of calyx segments about ½ mm.; petals 1¼–1½ mm.
Greatest diameter of drupe 4·5 mm.

Rh. commiphoroides Engl. et Gilg. Lugard 200. Under side.

Distribution: South-West Protectorate, Bechuanaland Protectorate, extending into Rhodesia.

N. E. Brown considered that it is allied to *Rh. Rehmanniana* Engl. I think it should be placed near *Rh. natalensis* Bernh. and is perhaps also allied to *Rh. Dinteri* Engl.

Kwebe hills 3,300 feet, Mrs. Lugard 200; Otjitjika, Dinter 2874, 2877; Tsumeb, Dinter 1684 (labelled *Rh. omahekae* N.E. Br.); Waterberg, Pole Evans 19317; Mochudi, Rogers 6318.

I have not seen *Rh. amboensis* Schinz in Bull. de l'herb. Boiss., Sér II, VIII, 639. (Ojavo in Ondongo, Ovampoland, Rautenau, bl. 31, 1.) According to the author it reminds one strongly of *Rh. commiphoroides*, but is clearly distinguished by smaller, conspicuously thicker leaflets (the terminal ones being 25–30 mm. long) more prominent nervature and smaller crenations. Schinz also noted that the sepals are slightly acute.

LANCEA group.

41. **Rh. lancea** L.f. suppl. 184; Linn. Syst. Veg. XIV, 294; Thunberg, Prodr. 52, Fl. Cap. ed. Schultes 263; Sonder l.c. 544; Engler l.c. 444; Diels l.c. 589, 640; Sim, Forest Flora 194, t. 46; *Rh. viminalis* Jacq. Hort. Schoenbr. t. 344 (non Vahl); Marloth, Das Kapland, 241, figs. 97, 101.

Rh. denudata Licht. in Roem. et Schult. Syst. VI, 661.

Description: Shrub or small tree (in South Africa seldom exceeding 20 feet in height) with the habit of a willow, quite glabrous, with elongated, angulate often reddish branchlets. Leaves petiolate, petioles long and slender, narrowly margined, concave above. Leaflets rigidly membranous or subcoriaceous, sessile, dark green and shining above, pale green below, linear-lanceolate narrowed at apex and base, shortly mucronate, acute or rarely

obtuse, sometimes slightly falcate, entire; midrib conspicuous, raised on both surfaces, lateral veins branched towards the margin, slightly raised (often on the upper surface only), tertiary veins reticulate (usually plain on the upper surface only). Panicles lax, much branched, axillary (shorter than the leaves) and terminal (about as long as the leaves), bracts small, linear subulate, pedicels delicate. Calyx segments unequal (two short and two long ones and usually one intermediate between them), petals oblong. Drupe subglobose, slightly depressed, dull greyish to shining brown, often slightly asymmetrical.

Rh. lancea L.f. Burchell 2728. Upper side.

Petioles 3–4 cm. long.
Terminal leaflets 9–12 cm. long; 6 mm. to 1·5 cm. broad.
Lateral leaflets usually nearly as long as the terminal leaflets and about as broad or slightly shorter and narrower.
Pedicels 2–3 mm. long. Calyx segments about ½ mm. long.
Petals almost 1½ mm. long. Drupe 4–5 mm. in diameter.

Distribution: Widely spread in South-West Africa and the interior regions of South Africa wherever there is groundwater available and penetrating coastwards to the Oudtshoorn division, the arid parts of the Albany division, Fort Beaufort and Kingwilliamstown divisions. (Recorded by Sim from Natal, but no specimen seen by me.) Occurs also in Rhodesia (reaching a height of 40–60 feet near Salisbury). Flowers generally from February to July.

Herb. Thunberg; Jacquin (*Rh. viminalis* Jacq. non Vahl): Drège in Herb. Kew and 3450 in Herb. Berol. (*Rh. viminalis* Vahl. *a*); on the Bushmans and Kat R., E. et Z. 1091 (*Rh. fragrans* Licht. ex Presl Bot. Bem. 41; Lichtenstein 194 in Herb. Berol. (*Rh. denudata* Licht.); on the Bushmans and Kat R., E. et Z. 1089 (*Rh. viminalis* Jacq. non Vahl); Burchell 2945, 3266; Great Namaqualand, Amboland, and Hereroland: Schultze 466, Range 411, 966; Schäfer 329, Dinter 288, 932, 988, Pfeil 87, 174, Francois 39*a*, Engler 6754, Trotha 16*a*, Seiner 174, Fritsch 64, Engler 6284, Pearson 3121, 4726, 9031; Calvinia, Diels 664 and 664*a*; Hantam mountains, Meyer; (Rondebosch, Hutton—evidently cultivated); hills near Matjesfontein, Schlechter 10923; in thickets along river beds near Schuurkraal, Karroo, Pearson 5000, 5030; Maggisfontein, Rehmann 2911; Pearson 1601, 4807; Oudtshoorn, Schoemanspoort, Britten 1651; Alicedale, Cruden 306; Piggot Bridge, Dyer 915; Table farm, near Grahamstown, MacOwan 604, 1395; Herbert division and Griqualand West, Marloth 813, Anderson 691, Wilman 1; Mafeking, Shantz 232; Orange Free State: Rehmann 2880, Smith 4365, Burtt-Davy 10730; Transvaal (widely spread, especially common near Pretoria): Leendertz 188, Burtt-Davy 534, Galpin 6991, Zahn 1684, Engler 2819, Shantz 248, Nation 297, Meune 2984, Burtt-Davy 2211, Galpin 5172, 5173, 8472, etc.

Specimens from Rhodesia which I have examined: Penther 96; Matopos, Galpin 7066; Salisbury, Eyles 1759; Bulawayo, Rogers 51. In the last two the terminal leaflets reach a length of over 16 cm.

Burchell No. 2728 in Herb. Berol. has leaflets only 2–3 mm. broad, and was distinguished by Engler as "forma angustissima".

Specimens from a plant collected by Keet (No. 1434) in fruit at Magnet Heights, Lydenburg district (29° 55′ E., 24° 50′ S.), alt. 4,500 feet, though close to *Rh. lancea* may be distinct. It forms a small tree about 6 feet high in bushveld on "Norita" formation associated with *Acacia spirocarpoides*, *Olea verrucosa*, etc. The texture and venation of the leaflets is the same as in *Rh. lancea*. They are relatively broader (terminal leaflets about 6 cm. long, 1½ cm. broad), often blunt, sometimes wavy on the margin, sometimes sparsely and irregularly toothed, the teeth being small and blunt as in *Rh. Gueinzii*. The fruit is dull grey, shining, slightly depressed and compressed (?), 6 mm. in greatest diameter. Perhaps a hybrid ?.

42. **Rh. viminalis** Vahl, Symb. III, 50 (non Jacq. nec E. et Z.); Thunb. Fl. Cap. ed. Schultes 263; Sonder l.c. 515; Engler l.c. 442; Diels l.c. 588, 640.

Rh. laevigata Herb. Jacquin (non L. nec Thunb.); *Rh. denudata* E. et Z. in Enum. 1090 (non Licht.); *Rh. elongata* E. et Z. in Enum. 1097 (non Jacq.); *Rh. pendulina* Jacq., Willd. Enum. 324; *Rh. Wildingii* Dehnh. Revist. nap. I, 3, 172; *Rh. fragrans* Licht. in Roem. et Schult. Syst. VI, 661; *Rh. pallida* E. Mey. in Drège exsicc.

Description: Willowlike bush or small tree (up to 30 feet in height) with elongated, glabrous, terete or subterete, often reddish branchlets. Leaves petiolate, petioles slender, subsemiterete, furrowed above. Leaflets sessile or subpetiolulate, membranous, subconcolorous (only slightly paler below than above), glabrous or finely ciliate, oblong-lanceolate, cuneate at the base, at the apex acuminate or acute, minutely mucronate, with entire, sometimes slightly undulate margin; midrib slightly raised on both surfaces, lateral veins distinct but barely raised, tertiary veins indistinct, reticulate. Panicles hirsute, multibranched with delicate ramifications, but ultimate branches somewhat densely flowered, axillary shorter than the leaves, terminal longer. Calyx segments ovate, acute, often hirsute on the outside. Petals oblong. Drupe subglobose.

Petioles 1·5–4 cm. long.
Length of terminal leaflets 4–8 cm. Breadth of terminal leaflets ·9–1·7 cm.
Lateral leaflets usually slightly exceeding three-quarters the size of the terminal leaflets.
Calyx segments ½ mm. long. Petals 1½ mm. long. Drupe 4 mm. in diameter.

Distribution: On the banks of rivers and vleys in Clanwilliam, Namaqualand, Bushmanland, on the banks of the Orange River to Griqualand West, also at Graaff-Reinet, flowering from September to January.

Sonder (l.c. 515) has distinguished a var. *pendulina* (= *Rh. pendulina* Jacq., Willd. Enum. 324; *Rh. pallida* E. Mey., in coll. Drège). The characters by which he tries to distinguish it are, however, of not much use. I have seen the original specimens of Jacquin in Herb. Vienna. The branches have rather lanky growth and have evidently been pendulous, but in herbarium specimens generally it is not advisable to try to distinguish this variety.

Rh. viminalis Vahl. Anderson 691. Under side.

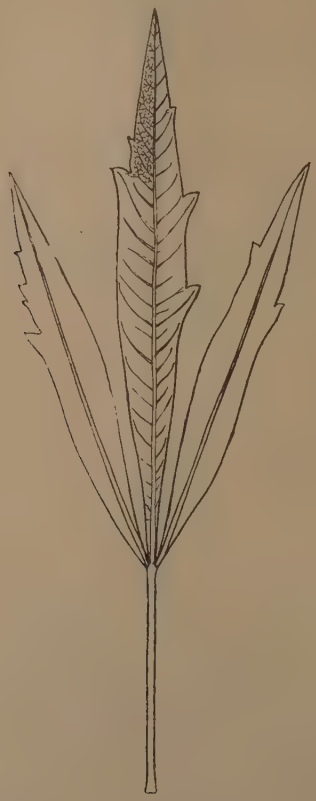
Specimens cultivated at Capetown, E. & Z. 1090; near Twenty-four Rivers (Clanwilliam), E. & Z. 1097; Namaqualand, near Klipfontein, Herb. Norm. Afr. 450 (Bolus 6526); Namaqualand, Pearson 6135, 6098; Bushmanland, Pearson 2582; near Doornpoort waterhole, Orange River expedition, 1910–11, Pearson 3136; Ramansdrift, Pearson 3112; Sendlings Drift, Pearson 1550, 6098; Verleptpraam, Orange River, Drège 3035; banks of Orange River. Pearson 3102 (some leaves extraordinarily broad, up to 2·3 cm., approaching an ovate form); Mazelsfontein, Griqualand West, Wilman 691; river banks near Graaff-Reinet, Bolus 134 (this was named *Rh. villosa* L.f. var. *glabrata* by Sonder).—(Schimper 163 from Amba Sea, Abyssinia, which was distributed as *Rh. viminalis* Vahl is *Rh. retinorrhoea*).

43. **Rh. Gerrardi** Harv. Ms.; Diels l.c. 588, 623.

Rh. viminalis var. *Gerrardi* Engl. l.c. 422.

Description: A shrub or small tree with at first pilose, later glabrous, subterete branchlets. Leaves petiolate, petioles slender, subterete with a shallow furrow above, at first pilose, later glabrous. Leaflets membranous, sessile, narrowly oblong or oblanceolate or oblong-ovate, narrowed at the base and generally also at the apex, which usually ends in an acute point; surfaces subconcolorous, at first pilose, later more or less glabrous; margin irregularly (and usually sparsely) crenato-dentate, especially towards the apex, teeth very shortly mucronate; midrib prominent, especially on the lower surface, lateral and tertiary veins delicate, but slightly prominent and very distinct, especially on the upper surface, the latter reticulate. Racemes axillary and terminal, shorter than the leaves or the terminal slightly longer, narrow, fairly compact (not diffuse as in *Rh. viminalis*) subglabrous in the type. Flowers pedicellate forming small glomerules, greenish yellow. Calyx lobes ovate. Petals oblong. Drupe ?

Length of petioles 1·4–2·25 cm.
Length of terminal leaflets 4–6 cm. Breadth of terminal leaflets about 8 mm.
Lateral leaflets generally about four-fifths the size of the terminal leaflets.
Length of pedicels 1–1½ mm.; calyx lobes ¾–1 mm.; petals 1¼–1½ mm.
Diameter of drupe ?



Rh. Gerrardi Harv., A. *typica*. Schlechter 3771. Upper side.

DISTRIBUTION: Basutoland, Tembuland, Natal (above 3,000 feet), eastern Transvaal, flowering in midsummer.

USES: Used in Basutoland for building huts and for hedges at Lydenburg.

Four varieties may be distinguished.

A. *typica.*—

Natal, Gerrard 1396; Leribe, Dieterlen 691; near Emmans, Natal, Wood 3645; bank of Tugela, 4,000 feet, Wood 3632; Little Tugela, near Glockners, 4,000 feet, Wood 3632; Estcourt, 3,700 feet, Dimmock-Brown 91; near Colenso, Wood 6581; on the banks of the Olifants River, 5,000 feet, Schlechter 3771; Lydenburg, Schlechter 3963.

B. *latifolia.*—Leaflets larger and broader than in the type (up to 3 cm.). Inflorescence subvillous and young branches, petioles, and leaflets more hairy than the type.

Rh. Gerrardi Harv., B. *latifolia* Schonl. Evans 5096*a*. Upper side.

Basutoland, Dieterlen 1201; Zomershoek, Lydenburg district, Burtt-Davy 7564 (= Wilms 246, 247, 248 = *Rh. viminalis* γ *Gerrardi* Engl. forma *pilosa* Engl. in Herb. Berol.); Ishlet River, Piet Retief district, Forest Dept. Herb. 5974; Graskop, Lydenburg district, along river banks, Evans (5096*a*); Palmer's farm, Waterval, Lydenburg district, Burtt-Davy 5327.

The following does not agree exactly with any of the foregoing as the leaflets are often dentate to near the base : Kaap River valley, near Barberton, Keet 1436. It is a small tree, 8–10 feet high. The drupes are red laterally compressed, generally broader than high. Their greatest diameter is 2½ mm., their height usually 2 mm.

C. *basutorum*.—Leaflets narrowly oblong or oblanceolate, acute at the apex, often mucronate, margin above the middle remotely and grossly dentate, teeth mucronulate, above subglabrous with the exception of the densely pilose midrib, below subtomentose, the prominent midrib and lateral veins densely pilose.

Of this I have only seen a single branch from Khanyane, Leribe district, Basutoland (Dieterlen 691. Herb. S.A. Museum 6065). It grows on mountain slopes and in ravines. It was named *Rh. viminalis* Vahl var. *Gerrardi* by Phillips in his "Flora of Basutoland."

The stem was simple, densely leafy, subterete, densely pilose. It bore female flowers on a terminal, lax panicle, barely equal in length to the leaves. I thought at first that it should be placed near *Rh. discolor* E. Mey., but as it is used for building huts it must be a large shrub or even a tree. In any case the resemblance to this species seems only to be superficial and is only due to the fact that an isolated branch was compared to it.

D. *montana*.—*Rh. montana* Diels in Engl. Bot. Jahrb. XL, 86, 639.—Branchlets and petioles glabrous. Leaflets 3–5 (rarely 6 or 7) foliolate, nearly glabrous or towards the margin slightly pilose, oblanceolate or obovate oblong, grossly crenato-serrate, teeth mucronulate. Panicle slender, longer than the leaves, pilose (as are also the ovate-lanceolate calyx segments).

Rh. Gerrardi Harv., D. *montana* (with 7 leaflets). Bolus 8837. Under side.

This has only been collected at Engcobo, Tembuland, by H. Bolus (No. 8837).

I append a translation of Diels' account, adding here and there a few additions and corrections in square brackets :—

" Shrub with brown glabrous branches. Petioles semiterete, slender, at the base enlarged and sheathing, glabrous. Leaves 3–5 foliolate. Leaflets papery, glabrescent or towards the paler margin a little hairy, below pale, towards the base gradually narrowed, otherwise oblanceolate or obovate-oblong, grossly [crenato-] serrate, teeth mucronulate, midrib prominent below, lateral veins a little prominent below, tertiary veins immersed. Inflorescence slender, exceeding the leaf; calyx segments triangular [ovate-lanceolate], slightly hairy, petals ovate-elliptical, twice longer [immature drupe glabrous, globose].

" Petiole about 3 cm. long, terminal leaflet about 6 cm. long, 2–2·5 cm. broad ; lateral leaflets about 3–4 cm. long, 1·2–1·5 cm. broad. The inflorescence reaches a length of 10 cm. The sepals are 1·5 mm. long [barely $\frac{3}{4}$ mm.], the petals 2·5 mm. long [$1\frac{1}{4}$–$1\frac{1}{2}$ mm.]."

44. **Rh. Gueinzii** Sond. l.c. 515 ; Engler l.c. 442, p. pte , Diels l.c. 589, 623, p. pte.

Description : A glabrous shrub or small tree 12–15 feet high, with slender, flexuous greyish or reddish, subterete or somewhat angular branchlets. Leaves petiolate, petioles slender, subterete, slightly canaliculate, especially towards the apex Leaflets membranous, dull green above, lighter below, sessile, lanceolate or oblong-lanceolate, from below the middle cuneate, acute or obtuse at the apex, often mucronulate, margin slightly revolute,

Rh. Gueinzii Sond. Howlett 4. Under side.

Rh. microcarpa Schonl. (5025). Upper side.

with a small blunt tooth at the end of each lateral vein ; midrib raised on both surfaces, lateral veins delicate, distinct, but barely raised, tertiary veins reticulate, indistinct. Panicles axillary, nearly as long as the leaves and terminal, slightly longer than the leaves, very lax. Calyx segments about $\frac{1}{2}$ mm. long, petals greenish yellow oblong. Drupe in the type (Gueinzius 1395) subglobose, verrucose, in Transvaal specimens generally brown, smooth or almost smooth, slightly asymmetrical, compressed or depressed.

Petiole 1·5–3·5 cm. long.
Terminal leaflets 4–7 cm. long; about 1·4 cm. broad.
Lateral leaflets slightly smaller than the terminal.
Pedicels 1–2 mm. long. Calyx segments ½ mm. long. Petals 1¼–1½ mm. long.
Drupe (in Gueinzius 1395) about 4 m.m. in diameter and greatest diameter in Transvaal specimens about the same.

DISTRIBUTION: Common in the Transvaal. The type (Gueinzius 1395) in herb. Kew which I have examined is supposed to have come from Natal. It flowers in February.

Mr. E. E. Galpin supplied the following information on his No. M 721:—

"Bastard Karee—Mphapashane (Sesuto name, but also applied by them to my No. M 64).

"Frequent in sand veld on the Springbok Flats, associated with *Acacia caffra* and *Peltophorum africanum*, and occasional in rooibosveld (a light sandy loam of reddish colour carrying a zuurveld vegetation typified by *Combretum apiculatum*, the local name for which is Rooibos) in association with *Combretum apiculatum*.

"Also frequently found in granite soil on the mountain slopes west of Naboomspruit.

"Its timber is greatly inferior to that of the other local species of *Rhus*, being twisted and very brittle and of little value. The amount of serration on the leaves varies considerably in different trees, and on some it is much more pronounced than on the tree from which the specimens now sent you were gathered."

Modderfontein, Konrath 112; Rustenburg, Nation 167; Potgietersrust, Burtt-Davy 2184; Magaliesberg, Engler 2770; Wonderboom farm, Burtt-Davy 4100; Groenkloof, Pretoria, Howlett 2 and 4; Pretoria kopjes, Leendertz 54, 174; boschveld between Elands River and Klippan, Rehmann 5144; Naboomspruit, Galpin M 721; Naboomfontein, Schlechter 4305; Zeerust, Burtt-Davy 90; Kaap River valley, near Louws Creek, Keet 1486; Pietersburg district? Grenfell 14, 16.

There are two rather stiff branches without flowers in Herb. Alb. Mus. with somewhat more oblong and slightly thicker leaves than in *Rh. Gueinzii*. They were collected at Pretoria (L. Reck No. 13, Colonial Herb. 1090). It is suggested that these are coppice shoots of *Rh. Gueinzii*. They agree remarkably well with the type of *Rh. leptodictya* Diels in the Berlin Herbarium, with which they have been compared (from tree-steppe, Bulawayo, Engler 2915).

45. **Rh. microcarpa** Schonl. n. sp.

DESCRIPTION: Frutex ramulis teretibus subvillosis. Folia petiolata, petiolis gracilibus dense pilosis supra canaliculatis. Foliola membranacea glauco-viridia subtus pallidiora, oblonga vel obovata, basi saepius valde angustata, apice acuta mucronata, primum utrinque dense pilosa deinde sparse pilosa, margine integra, costa venisque prominulis, venis reticulatis indistinctis. Paniculae dense pilosae laxae, axillares quam folia breviora, terminales longiores, floribus pedicellatis. Calycis lobi ovati. Petala oblonga. Drupa parva applanata.

Length of petioles 1–2 cm.
Length of terminal leaflets 4–6·5 cm. Breadth of terminal leaflets 1·5–2 cm.
Lateral leaflets generally a little over half the size of the terminal leaflets.
Length of pedicels ½–1 mm.; calyx lobes ¼–½ mm.; petals about 1¼ mm.
Diameter of drupe about 2½ mm.

DISTRIBUTION: Natal, flowering in midsummer.

Ingwangwe forest reserve, P.O. Riverside, about 4,000 feet, Household (5008, 5025); Ngomi, near Vryheid, Government forester (5147); Harding, 3,700 feet, D.F.O. (5054).

This distinct species is, on the one hand, close to *Rh. Gerrardi* var. *latifolia*; on the other hand, it leads up to *Rh. pyroides* Burch. var. *puberula* and may have been derived from Its height is 3–6 feet. It is common at Ingwangwe.

46. **Rh. crispa** Harv. Ms.; *Rh. Gueinzii* Sond. var. *crispa* Engl. l.c. 443.

DESCRIPTION: Arbor parvus ramulis gracilibus glabris teretibus. Folia petiolata, petiolis glabris gracilibus subteretibus supra profunde canaliculatis. Foliola glabra, membranacea saepius crispa supra saturate viridia subtus pallidiora, oblonga vel lanceolato-oblonga basi angustata apice obtusa, margine undulata vel subplana, rarius crenata, costa

utrinque prominula, venis paucis arcuatis utrinque leviter prominulis, nervis reticulatis indistinctis. Paniculae axillares quam folia breviorae laxae pubescentes, floribus parvis pedicellatis. Calycis lobi oblongo-ovati. Petala late oblonga. Drupa . . . .

Length of petioles 2–3 cm.
Length of terminal leaflets 5–8·5 cm. Breadth of terminal leaflets 1–2 cm.
Lateral leaflets one-half to two-thirds the length of the terminal leaflets sometimes broader than these.
Length of panicles 4–6 cm.; pedicels about 1 mm.
Length of calyx lobes and petals not fully developed in the material available.
Diameter of drupe ?

Rh. crispa Harv. Pegler 1446. Under side.

DISTRIBUTION: Natal and Kentani district (Transkei).

Natal. Gerrard 1397; Kentani district, overhanging stream, 1,200 feet, Pegler 1446 (fl. buds in February).

47. **Rh. ciliata** Licht. in Herb. Willd ; Roem et Schult. Syst. Veget. VI, 661 ; DC. Prodr. l.c. 71 ; Sonder l.c. 519 ; Engler l.c. 418 ; Diels l.c. 576, 628 ; *Rh. tridactyle* [sic !] Burch. trav. I, 340 ; *Rh. tridactyla* Sond. l.c. 516 ; Engler l.c. 446 ; Diels l.c. 590, 641.

Description : A small shrub, not more than 6 feet in height, with spreading, stiff, unarmed or thorny, glabrous or puberulous branchlets. Leaves petioled, petioles subterete or slightly winged, canaliculate above, glabrous or puberulous. Leaflets subcoriaceous, concolorous on both surfaces, glabrous or puberulous on lower surface and then often ciliate on the margin, linear or lanceolate, rarely oblong, narrowed at the base, at the apex obtuse, or sometimes mucronulate, more rarely subacute, straight or more rarely falcate ; margin entire ; midrib slightly sunk on upper surface, slightly prominent on lower, secondary veins arising at a very variable angle, sunk or fairly distinct, but rarely slightly prominent. Panicles glabrous or puberulous, axillary and terminal of variable length, very lax. Calyx segments ovate, petals oblong. Drupe subglobose, a little compressed.

Length of petioles about 10–13 mm.
Length of terminal leaflets 1·5–2·5 cm. (rarely shorter or longer, up to 5 cm.).
Breadth of terminal leaflets about 3 mm. (rarely up to 4 mm.).
Lateral leaflets about two-thirds the length of the terminal leaflets, often a trifle broader than these.
Length of panicles 1·5–6 cm. ; pedicels 1½–2 mm. ; calyx lobes about ¾ mm. ; petals about 1¼ mm.
Greatest diameter of drupe 4–5 mm.

Rh. ciliata Licht. Wilman 1255. Under side.

It is impossible to separate *Rh. tridactyla* and *Rh. ciliata*. Hairy specimens may be found in localities with glabrous forms. Armed or unarmed specimens occur also in the same localities. There is also some variety in the shape of the leaflets, in the conspicuousness of the lateral veins, in the breadth of the petiole, etc. In some respects this species approaches *Rh. longispina* E. et Z.

Distribution : South-West Protectorate, arid portions of northern Cape Province, Bechuanaland, Orange Free State, and western Transvaal, flowering from December to March.

Herb. Lichtenstein at Berlin (type of *Rh. ciliata* Licht.) ; Klaarwater, Griquatown, Burchell 1946 in Herb. Berlin (*Rh. concinuum* Burch. Ms.) ; Asbestos mountains, Burchell 1667, 2131 (types of *Rh. tridactyla* = Wilman 1339. 1255) ; Hay division, Karreefontein, Wilman ; Dummery, Wilman 2252, 2254 ; Griqualand West, at Baaksfontein, Klein Greef Puts, Klein Papkuil, Wilman 1255 ; Kimberley, Noran 13315, Wilman 2150, 2151, Marloth 835 (distributed as *Rh. puberula* E. et Z.), MacOwan 2573, 2574 ; near Mafeking, Bolus 6404 ; near Vryburg, Rogers 26791 ; near Christiana, Bloemhof district, Burtt-Davy 1614, 12850 ; Schoenheid, Bloemhof district, Burtt-Davy 9405 ; Naval Hill, Bloemfontein, Potts 75, Drège 6804*a* ; Orange River, Z. 339 and Burke 504 ; Rhenosterkop, near the Vaal River, Z. 337 and Burke 275 ; Olifantsfontein, Orange Free State, Rehmann 3518 ; Ottoshoop, Transvaal, Engler 2901 ; Wolmaransstad, Rogers 18487, 20617.

forma *fastigiata* Schonl.—Similar to the type, except that it has a fastigiate (not squarrose) mode of growth and the lateral veins are more prominent on the under side of the leaflets, but Engler 6218 and 6227 connect extreme forms with the type. Dinter mentions that it is 1 m. high and grows in masses on grassy plains.

South West Protectorate : Ankas, Dinter 833 ; Otjosandjon, Seiner 142 ; Ovampoland and North Hereroland, Engler 6218, 6227.

48. **Rh. dregeana** Sond. l.c. 516 ; Engler l.c. 445 ; Diels l.c. 590, 625, 641, fig. 6 D, 625.

Description : A small, much branched glabrous shrub, generally not over 3 feet in height, with squarrose or ascending, sometimes purpurascent slightly angulate branchlets. Leaves petioled, petioles margined. Leaflets coriaceous, subconcolorous, shining above, narrowly linear, sometimes slightly falcate, narrowed at the base, at the apex acuminate, shortly mucronate ; margin entire ; midrib slightly prominent on both surfaces, other veins indistinct. Panicles very lax, axillary shorter than the leaves. Calyx lobes ovate, obtuse, petals oblong. Drupe subglobose, yellowish, shining, slightly fleshy when ripe.

Length of petioles generally about 1 cm.
Length of terminal leaflets 3·5–6 cm. Breadth of terminal leaflets 1·2–2·5 mm.
Lateral leaflets generally two-thirds the length of the terminal leaflets and about as broad as these.
Length of pedicels 2–3·5 mm. ; calyx lobes about $\frac{3}{4}$ mm. ; petals about $1\frac{3}{4}$ mm.
Greatest diameter of drupe 5·5 mm.

Rh. dregeana Sond. Bolus 43. Under side.

Diels (l.c. 641) remarks : " What has been placed together as *Rh. dregeana* Sond. represents perhaps less a strict monophytic connection, but rather the artificial union of several branches of *one* type." This type is perhaps *Rh. ciliata* Licht., from some of the glabrous forms of which it is not separated by good technical characters. The leaflets in *Rh. dregeana* are, however, more pointed and generally much longer, the flowers and fruits larger, etc. [*Rh. trifoliolata* Bak. f. in Journ. of Bot. XXXVII (1899) 429 coll. by Rand (No. 66) at Bulawayo is very close to *Rh. dregeana*. Here, however, in most of its leaflets the lateral veins are very distinct.]

Distribution : Mountains of north-eastern Cape Province and also in the Orange Free State near Spionkop, between Philippolis road and Smartryk, flowering in autumn.

Sneeuwberge, Drège 2374 ; Mooiplaats, Stormberge, 4-6,000 feet, Drège 3448 ; near Graaff-Reinet, 2,500 feet, Bolus 135 ; Sneeuwberge, 4,000 feet, Bolus 43 ; Graaff-Reinet, Sr. Francis 29 ; Burchell 2853 (sub *Rh. lancea* L. f.) ; Burghersdorp, 5,000 feet, Flanagan 1530 ; in gorge below Buffels River waterfall, Basutoland, circ. 7,100 feet, Galpin 6599 ; near Philippolis, Orange Free State, circ. 5,050 feet, Smith 4489 (rare).

49. **Rh. erosa** Thunb. in Fl. Cap., ed. Schultes 363 ; Sonder l.c. 516 ; Engler l.c. 439 ; Diels l.c. 587, 595, 624, 625, fig. 6 A, B, C, 642.
Rh. serraefolia Burch. trav. II, 100.

Description : A much branched glabrous, sometimes decumbent shrub with subflexuous branchlets, usually 3–6 feet high, sometimes reaching a height of 10 feet and up to 30 feet across. Leaves very variable in size, petioled ; petioles slender, margined, canaliculate above. Leaflets coriaceous, usually "varnished" (especially on the upper side), linear, sometimes slightly falcate, narrowed towards the base, acute ; margin in a varying degree eroso-dentate or sometimes entire on the same plant, teeth acute ; midrib prominent on both surfaces, lateral veins more or less prominent on both surfaces, tertiary veins usually indistinct or not visible. Panicles very lax with slender branches, usually somewhat shorter than the leaves, bracts very small. Calyx segments unequal, obovate, very obtuse. Petals obovate. Drupe yellowish, shining, subglobose.
Length of petioles 2–3 cm.
Length of terminal leaflets up to 12 cm. Breadth of terminal leaflets (without teeth) 2–5 mm.
Lateral leaflets similar to terminal leaflets, usually about three-quarters of their lengths.
Length of pedicels 2–3 mm. ; calyx lobes about ½ mm. ; petals about 1 mm.
Diameter of drupe about 4 mm.

Known as "Bezenbosch." Native name Tselabelo.

Rh. erosa Thunb. Phillips 3121. Upper side.

Distribution : Stony kopjes, usually frequent, in the mountainous districts of the Midlands and north-eastern Cape Province, Basutoland and Orange Free State (Rogers 2484 has been distributed with the erroneous locality "Table Mountain, Capetown").

It is used for making rough brooms and thatching sheds. Grown in gardens it is quite ornamental. Phillips notes that the witch doctors in Basutoland use it for "rain-making and as a medicine for diarrhœa in man and cattle." It is also used as a hairbrush by Kaffirs in the Orange Free State.

Herb. Thunberg ; Burchell 2729, 2697 (in Herb. Kew, etc.) ; Koutveld mountains, near Murraysburg, 5,000 feet, Tyson 142 ; Graaff-Reinet, 3,300 feet, Bolus 535, Bowker 39 ; common near Grootfontein, Middelburg, C.C., Schonland ; near Rosmead station, Flanagan 1529 ; Cradock division, Z. 346, Cooper 476, Kuntze ; Somerset East, Atherstone 171 ; Roode Rand Farm, near Klaas Smits River, 3,550 feet, Galpin 2512 ; Winterfield, Drège 813 ; Shiloh, Drège, E. et Z. 1133, Baur 909 ; Cala, Pegler 1742, ; Colesberg, Shaw 40 ; Majuba Nek, and Sterkspruit, Herschel division, Hepburn 250, 33 ; Leribe plateau, Basutoland, 5–6,000 feet, Dieterlen 78, Phillips 842 ; Bethlehem, Phillips 3121 ; Potts 3309, Bloemfontein, Rehmann 3832 (var. *subintegra*, Sczyscz.), 3795, Potts 56 ; Ladybrand, 6,000 feet, Patterson (5076) ; near Ficksburg. Potts 3165 ; near Trompsburg, Orange Free State ; near Fouriesburg, Potts 3276.

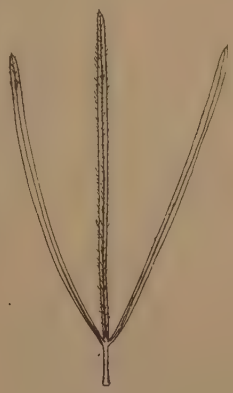
50. **Rh. Bolusii** Sond. Ms.; Engler l.c. 436; Diels l.c. 584, 626.

This species has only been collected by Bolus near Graaff-Reinet, and may have to be dropped in view of Diels' statement (l.c. 626) that in a plant of the Berlin Bot. Gardens (1854) the leaflets of *Rh. erosa* are distinctly broadened, and thus assume entirely the appearance of *Rh. Bolusii* Sond. He is, therefore, inclined to look upon the latter as a local form of *Rh. erosa*. He explains that its occurrence is possibly due to a favoured habitat which might produce a form like the one produced under cultivation. Perhaps a slight indication that this view is correct may be the fact that Mr. R. A. Dyer found in one flower of Bolus' plant a sixth petal which was smaller than the others. Similar abnormalities are often found in cultivated plants. The flowers are larger than in *Rh. erosa*. Diels' views mentioned do not tally with his statement (l.c. 585) that he thinks that *Rh. dentata* Thunb. is its nearest relation. Engler placed it next to *Rh. oxyacantha* Cav. found on the Cape Verde Islands and in the Mediterranean Region.

Description: A glabrous shrub with suberect, slender, flexuous branchlets. Leaves petiolate, petioles slender, slightly margined, canaliculate above. Leaflets subcoriaceous, somewhat shining above, obovate-oblong or oblong, narrowed towards the base and with acute, often mucronate apex, margin from below the middle or higher up serrato-dentate, teeth acute, subacute or blunt, midrib and lateral veins prominent, tertiary veins not visible. Panicles very lax with slender branches, bracts small ovate-lanceolate. Calyx segments ovate, bluntish or triangular, acute. Petals broadly oblong. Drupe . . . .

Length of pedicels 1·5 cm.
Length of terminal leaflets 2–3 cm. Breadth of terminal leaflets about 1 cm.
Lateral leaflets resembling the terminal leaflets and usually about two-thirds their length.
Length of pedicels 2–3 mm.; calyx segments about ¾–1 mm.; petals about 2 mm.

Rh. Bolusii Sond. Bolus 737. Upper side.



Rh. gracillima Engl. Rehmann 1882. Upper side.

Distribution: Cave Mountain, near Graaff Reinet, 3,900 feet, Bolus 737.

51. **Rh. gracillima** Engl. l.c. 445; Diels l.c. 590, 614.

Description: A very slender shrub, 2–4 feet high, unbranched, except when it reaches 3–4 feet, sparsely and patently pilose all over (except in var. *glaberrima* Schonl.). Leaflets shortly petioled, petioles canaliculate and slightly margined above. Leaflets coriaceous, concolorous, very narrowly linear, sometimes slightly falcate, narrowed towards the base

and at the apex very acute ; midrib prominent on both surfaces, other veins not visible. Panicles very lax, and with very delicate branches, axillary ones generally slightly shorter than the leaves, sometimes much longer, terminal longer than the leaves, bracts small, subulate. Calyx segments ovate acute, petals oval. Drupe . . . .

var. *glaberrima* Schonl. [*Rh. filiformis* Schinz in Vierteljahrschr. d. naturf. Ges. in Zürich LV (1910) 239].—Glabrous and with longer leaves than the type.

Length of petioles 5–7 mm. (in var. *glaberrima* up to 15 mm.).
Length of terminal leaflets 6–7 cm. (in var. *glaberrima* up to 8 cm.).
Breadth of terminal leaflets 1·5 mm. (in var. *glaberrima* up to about 1 mm.).
Lateral leaflets very much like the terminal ones and almost as long.
Length of bracts 1 mm. ; pedicels 1–2 mm. ; calyx segments ¾–1 mm. ; petals 1½–2 mm.

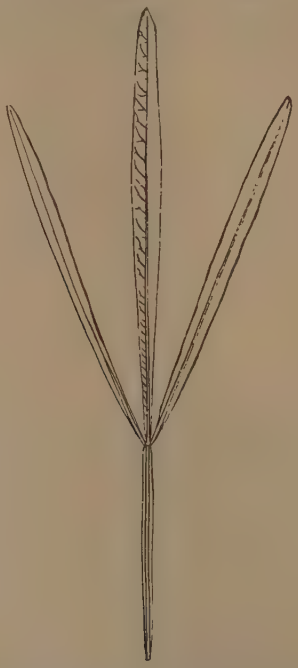
DISTRIBUTION : Transvaal.

Between Mienaarsfarm and Elands River, Boschveld, Rehmann 1882 ; Premier Mine, Rogers 22421. var. *glaberrima*—hills near Wilge River, 4,600 feet, Schlechter 3746 (fl. in Nov.).

52. **Rh. Wilmsii** Diels in Engl. Bot. Jahrb. XXIV (1898) 501, l.c. 589, 614, 641.

DESCRIPTION : A much branched glabrous shrub with slender branchlets. Leaves petioled, petioles rather long, distinctly margined, canaliculate above with a slight ridge in the centre of the channel. Leaflets concolorous, coriaceous, linear, narrowed towards the base, blunt or emarginate at the apex or narrowed into a mucro, margin entire or very slightly undulate, midrib very prominent on both surfaces, lateral veins prominent on both surfaces, tertiary ones not visible. Inflorescence, flowers, and fruit unknown.

Length of petioles 3–3·5 cm.
Length of terminal leaflets 7–9 cm. · Breadth of terminal leaflets 4–7 mm.
Lateral leaflets very much like the terminal leaflets and not much shorter.



Rh. Wilmsii Diels. Wilms 249. Upper side.

DISTRIBUTION : Only found by Wilms (No. 249) at the large waterfall, Lydenburg, Transvaal.

53. **Rh. Keetii** Schonl. n. sp.

Description : Frutex glaberrimus gracillimus circ. 1 m. altus saepius simplex vel apicem versus parce ramosus cauli basi vix 5 mm. diam. superne tenuissimo vix 1·5 mm. diam. tereti ; foliis longe petiolatis, petiolis gracilibus supra canaliculatis vix alatis basi incrassatis foliolis anguste linearibus basi et apice angustatis summo acutissimis saepius ± falcatis utrinque subconcoloribus margine integris anguste albo-cartilagineis, costa utrinque prominenti, nervis vix prominentibus vel saepius immersis, foliolis lateralibus et terminalibus subaequalibus vel inaequalibus ; paniculis terminalibus laxissimis bracteis parvis lanceolatis acutis, calycis segmentis ovatis basi contractis, petalis pallide flavis late oblongis, floribus foemineis cum staminodiis ; drupa subglobosa, leviter depressa.

Rh. Keetii Schonl. Keet 1435.
Under side.

Petiole 3½–5 cm. long (often curved), barely 1 mm. in diameter.
Leaflets, both terminal and lateral, 11–15 cm. long, about 3 mm. broad.
Calyx segments ¾–1 mm. long. Petals about 1·7–2 mm. long.
Drupe c. 5 mm. in diameter.

DISTRIBUTION: Only found near Lydenburg, Transvaal.

Keet 1345.—On the Klip River in Steelspoort Park, Lydenburg district, 30° 0′ E. and 24° 50′ S., 4,000 feet, June (fl. and fr.).

Mr. Keet notes: "Slender bushes about 3–4 feet high, mostly single-stemmed, stems pencil thickness. Found in grass-covered and very rocky places."

This species is closely allied to *Rh. Wilmsii* Diels from the same neighbourhood, of which the flowers and fruits are unknown. Perhaps it may have to be referred to it later as a variety, but I have thought it best to keep it separate for the present because in *Rh. Wilmsii* the petioles and leaves are not so slender, the wings of the petioles are more pronounced, the leaflets generally shorter and suddenly contracted at the apex, the lateral veins are prominent on both surfaces. In both species there is a narrow ridge in the middle of the channelled upper side of the petiole.

HORRIDA group.

54. **Rh. horrida** E. et Z. in Enum. 1135; Sonder l.c. 415; Engler l.c. 415; Diels l.c. 575, 635; *Rh. platypoda* E. Mey. in Drège exsicc.

DESCRIPTION: A shrub with rigid, patent, usually thorny branchlets. Young leaves, panicles, pedicels and calyx densely covered with grey or red glands. Leaves more or less fasciculate, petiolate, petioles distinctly winged. Leaflets coriaceous, linear-cuneate, obtuse, entire. All veins (including midrib) immersed. Panicles few flowered, axillary, shorter than the leaves. Pedicels very short. Flowers very small. Drupe oblique, glabrous, beaked with short styles.

Petioles 2–8 mm. long, usually ½ mm. broad.
Terminal leaflet 4–8 mm. long; 1–3 mm. broad.
Lateral leaflets a little shorter than the terminal.
Petals a little over 1 mm. long.
Drupe 4 mm. long; 5 mm. broad.

Rh. horrida E. et Z. Schlechter 11179. Under side. 3/2.

DISTRIBUTION: Namaqualand and Bushmanland, flowering throughout the summer.

In sandy soil, alt. III, mountain sides of the Khamiesberg and in Namaqualand, E. et Z. 1135, Ecklon 35; Springbokkeel, Ecklon 45, Z. 348; hills near Rietkloof, 2,500 feet, Schlechter 11179; Drège in Herb. Kew (*Rh. platypoda* E. Mey. *b*).

55. **Rh. longispina** E. et Z. in Enum. 1135; Sonder l.c. 520; Engler l.c. 415; Diels l.c. 575, 635.

DESCRIPTION: A thorny squarrose shrub up to 10 feet high. Stem and branches grey. Young organs (branchlets, leaflets, panicles) covered with red glands, older ones glabrous. Branches short, 3–4 cm. long, and with thorny end or bearing short branchlets which turn into thorns. Leaves petiolate, mostly fasciculate, petioles very variable in length, more or less according to the size of the leaflets, usually winged, the wings varying in width even in leaves of the same size. Leaflets coriaceous, cuneate-obovate, obtuse or

subemarginate, entire, the lateral ones often oblong and slightly asymmetrical at the base. Midrib and lateral veins (which are not quite straight and branched towards the margin) raised on both surfaces, tertiary veins coarsely reticulate (not visible in small leaflets). Panicles numerous, usually clustered with the leaves, densely covered with red glandular hairs, usually slightly shorter than the leaves, with few and short side branches. Flowers shortly pedicellate. Calyx segments ovate, green. Petals pale yellowish, oblong, narrowed towards the base. Drupe green, sometimes turning brown, rather juicy at first, shining, subglobose, getting flattened when old, often asymmetrical, retaining sometimes the hardened styles.

Petioles 5 mm. to 3·5 cm. long and in exceptional cases up to 3 mm. broad.
Terminal leaflets 1–5 cm. long; 5 mm. to 2·2 cm. broad.
Lateral leaflets one-third to one-half the size of the terminal leaflets.
Pedicels 1 mm. long. Calyx segments barely $\frac{1}{2}$ mm. long.
Petals about $1\frac{1}{2}$ mm. long. Drupe 5–$5\frac{1}{2}$ m.m. in diameter.

Rh. longispina E. et Z. E. and Z. 1048. Upper side.

Rh. longispina E. et Z. Dyer 61. Upper side.

Distribution: In somewhat arid places from Swellendam to East London penetrating inland to Graaff-Reinet, usually flowering in late summer or autumn.

The affinities of this species seem to point to *Rh. rigida* though it is often placed near *Rh. lucida*. In some respects it also approaches *Rh. ciliata* Licht. The great variability of this species in the size of leaflets, the length and breadth of the petioles is noteworthy, and while in other species of *Rhus* great variability raises a suspicion of hybridization, such a suspicion cannot be entertained here.

Burchell 5381, 5383. 3312; Swellendam, Mund and Maire; hills near Mossel Bay, 50 m., Schlechter 5725; Keurboom R. hill, Duthie 747; Armoed, Britten 1747; west bank of Gamtoos River, near Hankey (Presl), 150 feet, Fourcade 2280; Uitenhage, Ecklon (labelled "*Rhus pterota* Presl"); ib., (Krakakamma) Z. 456, 2245; amongst bushes on the banks of the Zwartkops River, Ecklon 46, 1048; Uitenhage, Addo, and near Fort Beaufort, E. et Z. 1116; Redhouse, Paterson 2112; Aloes, J. L. Drège 3165; Sandflats, Rogers 191; Cookhouse, Rogers 2457; Graaff-Reinet, Bolus 660; commonage north of Grahamstown, Dyer 58, 61, 62; Otterburn, Fish River randt, Schonland; Nahoon River mouth, Galpin 5689.

On the farm Aylesby, near Riebeek East, two forms are found not far from one another. One has deep green leaflets; in the other they are grey. In the former the leaves are always a little larger than in the latter.

56. **Rh. rigida** Mill. dict. No. 14; Sonder l.c. 520; Engl. l.c. 416; Diels l.c. 576, 633, 634, fig. 7 L.

Rh. rimosa E. et Z. in Enum. 1134.

Rh. triceps E. Mey. in Drège exsicc.

Description: An erect, rigid, glabrous shrub about $1\frac{1}{2}$–3 feet high, with approximate and sometimes purplish and resinous branchlets. Leaves shortly petiolate, petioles canaliculate above, narrowly margined. Leaflets rigid, coriaceous, somewhat glaucous, sometimes resinous, cuneate lanceolate or linear lanceolate, apiculate, concolorous on

both surfaces, margin entire or with one or two acute teeth at the apex; midrib slightly raised, immersed or slightly sunk on the upper surface, slightly prominent on the lower, lateral veins invisible or barely visible, tertiary veins invisible. Calyx segments ovate, petals oblong. Drupe glabrous, oval or oblong, compresseed and depressed, sometimes slightly oblique, tricuspidate.

Length of petioles 1–1·5 cm.
Length of terminal leaflets 4–5 cm. Breadth of terminal leaflets 5–8 mm.
Lateral leaflets about two-thirds the length of the terminal leaflets and about as broad as these.
Length of calyx segments about ¾ mm.; petals 1¼–1½ mm.
Greatest diameter of drupe about 6 mm.

Rh. rigida Mill. Pillans (5132). Under side.

Distribution: In the north of the south-west Cape region from the Winterhoek to the Giftberg. Flowers from September to November.

It is very difficult to suggest close affinity of this species with any others. Diels places it into his *Lucida* group. The fruit is very much as in *Rh. populifolia* E. Mey. and allies, but the vegetative organs are somewhat close to those of some forms of *Rh. magalismontana* Sond.

Sonder (l.c. 520) has separated as a variety Drège 6797 from the Giftberg with panicles more compound than in the type as long or longer than the leaves, but there seems to be no justification in keeping this up.

Drège in Herb. Kew (*Rh. triceps* E. Mey.); between Twenty-four River and Olifants River, Ecklon 45; mountains near Heerelogement, E. & Z. 1134 (*Rh. rimosa* E. et Z.); summit slopes of Pikenierspass, Pillans 5132; Packhuisberg, 2,000 feet, Schlechter 10798; Saron, 1,000 feet, Schlechter 7884; plains west of the Giftberg, on rocky places poor in vegetation, 300 feet, Diels 409 (this has a more straggling habit and shorter leaves than the type).

57. **Rh. magalismontana** Sond. l.c. 510.

Rh. burkeana Sond. l.c. 514; Engler l.c. 417; Diels l.c. 576, 639.

Rh. coriacea Engl. l.c. 418; *Rh. oblanceolata* Schinz in Beitr. zur Kenntn. d. afr. Flora XXI, Bull. de l'herb Boiss. 2 ième série VIII, 638.

Description: A much branched shrub with young branches, leaves and panicles shortly tomentose (tomentum often yellowish or fuscous), branchlets terete, striate. Leaves petiolate, petioles one-third to one-half the length of the terminal leaflets, broadly furrowed above, marginate, the margins slightly thickened. Leaflets subcoriaceous, sessile, often

glabrous when old, obovate oblong or oblong with a cuneate base and obtuse, rarely acute, mucronate apex; margin entire, not revolute; midrib prominent on both surfaces, the lateral and tertiary reticulate veins also usually fairly prominent. Panicles axillary and terminal, shorter than the leaves or a little longer, loosely flowered, bracts subulate, flowers pedicelled. Calyx lobes ovate-triangular, acute. Petals oblong. Drupe shining, subglobose.

Rh. magalismontana Sond. Moss 2969. Under side.

Rh. magalismontana Sond. Leendertz 1313. Under side.

Length of petioles 1–2 cm.
Length of terminal leaflets 3½–6 cm. (sometimes much smaller).
Breadth of terminal leaflets (average about 1 cm.).
Lateral leaflets about two-thirds the size of the terminal leaflets.
Length of calyx lobes about ¾ mm.; petals about 1¾ mm.
Diameter of drupe (Burtt-Davy 5332) barely 4 mm.

DISTRIBUTION: Stony kopjes in the Transvaal.

Magaliesberg, Z. 11 (in Herb. S.A. Mus.), Engler 2812 (in Herb. Berlin), Burtt-Davy 2666; rocky places on the Aapies River, Z. 335 (type of *Rh. burkeana* Sond.); near Johannesburg, Galpin 1469, 1493, Moss 2969; Ottoshoop, Engler 2812; between the Drakensbergen and Pretoria, Wilms 244; near the Houdek, 4,800 feet. Schlechter 2733; near Pretoria and Klippan, Rehmann (type of *Rh. coriacea* Engl.); Warmbaths, Leendertz 1313, Burtt-Davy 5332; on the Olifants River, 5,000 feet. Schlechter 3773 (type of *Rh. oblanceolata* Schinz); Paardevalley, near Zeerust, Burtt-Davy 7183; northern Transvaal, Le Doux 4.

Diels (l.c. 630) states that in *Rh. burkeana* Sond. he found most typical sunk stomata such as he found in no other species of African *Rhus*. (See the illustration of his, Pl. XIV, S.)

DISCOLOR group.

58. **Rh. discolor** E. Mey. in Drège exsicc; Sonder l.c. 507; Engler l.c. 447; Diels l.c. 590, 614.

Rh. rufescens E. et Z. in Enum. 1093 (non Hamilton).

Rh. villosissima Engl. l.c. 447.

Rh. grandifolia Engl. l.c. 434.

DESCRIPTION: A low poorly branched shrub, 1½–3 feet high, with densely grey or fulvoustomentose branchlets, petioles and inflorescences. Leaves petiolate, petioles short, semiterete, canaliculate above. Leaflets coriaceous, above green more or less pubescent or

pilose, rarely villous or glabrous, below more or less fulvous or whitish tomentose with adpressed hairs, rarely villous, the midrib and veins sometimes more decidedly pilose, linear lanceolate or lanceolate or oblong, rarely obovate, more or less cuneate at the base, apex usually acute, sometimes obtuse, usually mucronate ; margin slightly revolute, entire or in the broader leaflets often more or less grossly dentate or rarely eroso-dentate ; midrib not prominent or slightly prominent above, decidedly prominent below, lateral veins not prominent or even depressed above, not prominent or more or less prominent below, tertiary veins reticulate, but only sometimes plainly visible above, not visible below. Panicles dense, axillary a little shorter than the leaves and terminal, somewhat longer, branches short, multiflowered, flowers glomerulate, lower bracts foliaceous, lanceolate or linear, upper small linear. Calyx segments lanceolate acute or subovate, tomentose on the outside. Petals subovate. Drupe subglobose, when young sometimes puberulous, when ripe yellowish, subglobose, glabrous, shining, sometimes crowned with the enlarged styles.

Length of petioles 5–8 mm. (in rare cases up to 1·6 cm. ; in one case up to 3·3 cm.).
Length of terminal leaflets 5–8 cm. (up to 16 cm. in *Rh. grandifolia*, 3½ cm. in Baur 912).
Breadth of terminal leaflets 1–1·5 cm. (7·5 cm. in *Rh. grandifolia*, 3 mm. in Baur 912).
Lateral leaflets about two-thirds to four-fifths the size of the terminal ones.
Length of pedicels barely 1 mm. ; calyx segments ¾–1 mm. ; petals 1¼–1½ mm.
Diameter of drupe 4–5 mm.

Rh. discolor E. Mey. Drège 1839.

Rh. discolor E. Mey. Drège 1839.

Distribution : Amongst grass and low shrubs on mountains of south-east Cape Province, Komgha division, Transkei, Pondoland, along the Drakensberg range, Natal, Orange Free State, Transvaal. Flowers from November to January.

Allied to *Rh. arenaria* Engl. (Angola).

Like so many other " species " of *Rhus*, *Rh. discolor* is extremely variable, which shows itself chiefly : (1) in the hairiness of the leaflets, ranging from glabrous upper surfaces through pilose ones to almost villous. *Rh. villosissima* Engl. was based on an extreme form. Already Diels (l.c. 590) has sunk this species in *Rh. discolor* and Engler has later done this also The former says : " die Behaarung wechs lt überall bedeutend " ; (2)

Rh. discolor. E. Mey. Rogers 1693. Upper side

the shape of the leaflets. A broadening of these is especially seen in *Rh. grandifolia* Engl. but already in Meyer's type of *Rh. discolor* (in Herb. Kew) some leaflets are almost obovate-cuneate ; (3) the broadening is usually accompanied by an increase in length ; and (4) it is also usually accompanied by the appearance of irregular teeth in the upper part of the leaflets. These, however, are also already found sparingly in Meyer's type.

Taking extreme forms such as *Rh. grandifolia* Engl. (Rehmann, Inanda) and Baur 912, for which some measurements were given above, it seems almost incredible that they should have to be placed into the same species, but there is no other course open, since they are connected by intermediate forms.

Engler (l.c. 448) recognized two forms, in addition to the type :—

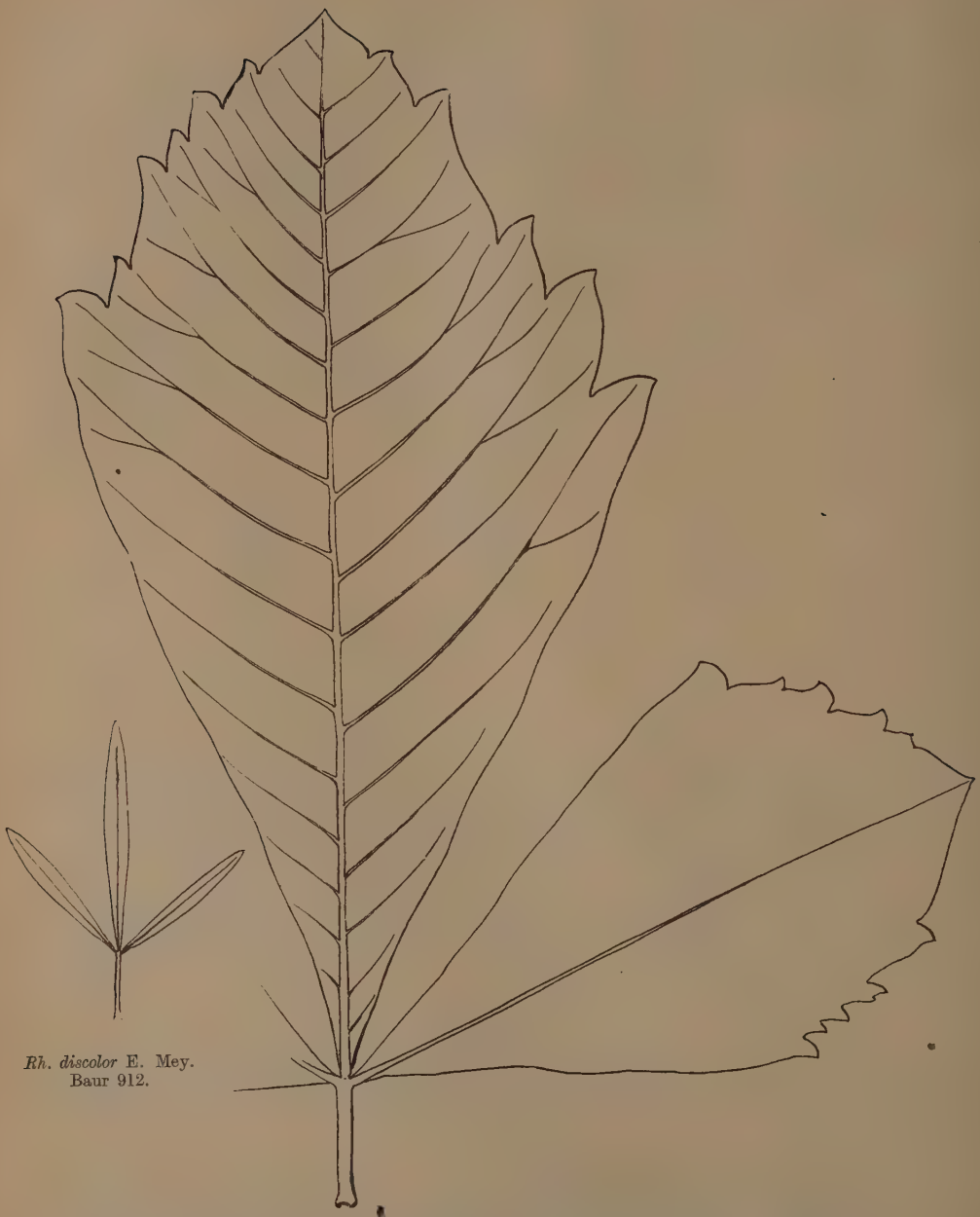
β paucinervis.—Leaves sometimes with five leaflets, leaflets acute, sometimes bidentate, lateral veins less numerous, ascending (not spreading).—None of the characters given, are distinctive.

Faku, Gerrard 1403 in Herb. Kew ; Transvaal, Page's hotel, Rehmann.

γ brevifolia.—Leaves shorter, oblanceolate, 4–5 longer than broad.

Drakensberg, Rehmann in Herb. Berol.

This, again, cannot stand, as in Rehmann's type the terminal leaflet is up to 4·5 cm. long, which is not much less than what we find in other forms.



Rh. discolor E. Mey.
Baur 912.

Rh. discolor E. Mey., D. *grandifolia* (Engl.). Rehmann. (Tertiary veins reticulated.)

I propose to divide the species into the following forms :—

A. *typica.*—Leaflets lanceolate or oblanceolate, rarely broadened, mucronate, above pubescent. Lateral veins not prominent (or at all events not conspicuously so) on the lower surface. Terminal leaflets 5–7 cm. long, rarely slightly shorter or longer.

B. *villosissima* (*Rh. villosissima* Engl.).— Adult leaves more hairy on both surfaces, lateral veins generally very prominent on the lower surface. Shape of leaflets as in A, but usually slightly larger.

C. *latifolia.* –Leaflets ovate or obovate, entire or dentate. Lateral veins not prominent on the lower surface. As these veins are longer than in A and B they curve upwards. The leaflets reach a length of 11 cm.

D. *grandifolia* (*Rh. grandifolia* Engl.).—Leaflets obovate-cuneate, often grossly irregularly *eroso-dentate*, but on the same shoot there may be leaflets agreeing with A in shape. Adult leaflets glabrous above, reaching a length of 16 cm. Lateral veins prominent on lower surface.

A. Between Sandplaats and Komgha, Drège 3449, 5584 (one leaflet approaches c); Cowie Mt., Bedford, Bennie 281 ; Hogsback, c. 6,000 feet, Rattray 66 ; Katberg, MacOwan 864 (largest terminal leaflet 12 cm. long); Winterberg and Chumie mountain, E. et Z. 1093 ; mountain side, Gwetwyn farm, Queenstown division, Galpin 8301; N'Achbanya mountain, Queenstown division, Galpin 1903 ; hills near Shiloh, Baur 912 (in Herb. Berol. with the smallest leaflets known); Mvanyeni, near Cedarville, Griqualand East, Bandert 106*a* (leaflets almost linear, very narrow); Qumbu district, Dwyer 5111 (the collector notes that it forms *a* mass of underground roots which interfere with ploughing and that the drupes are eaten by children); Ntsubane, near Lusikisiki, Evans (5048, 5052); Ingwangwane, Household 5047 ; hills near Ladysmith, 4,000 feet, Wood 849 ; near Houderivier, c. 4,500 feet, Schlechter 3737 ; Majuba, Rogers 53 ; Magaliesberg, Burke 328 ; Johannesburg, Moss 6175 ; Carolina, Rogers 1152*a* ; Wonderfontein, Nelson 259.

The following approach B: Barber 611 ; Matatiele, Hilner 26 ; Sterkspruit, Herschel district, Hepburn 2, 155 ; Pietpotgietersrust, Rogers ; The Downs, Pietersburg division, Rogers 21879 ; Graskop forest station, Evans (5110).

B. Houtbosch, Rehmann 5557, Bolus 10999 ; Carolina, Rogers 11552 ; rocky mountain sides near Komgha, 2,000 feet, Flanagan in Herb. Austr. Afr. 1421 ; Kokstad, 4,700 feet ; Camperdown, Alexandra county, Natal, Rudatis 1808 ; Klip River, near Johannesburg, Engler 2741 ; river bank near Lydenburg, Wilms 250.

C. Leribe, Basutoland, Phillips 551, 614, 844 (in the last number some of the leaflets are petiolulate, and the petiole reaches a length of 3·3 cm.); ib., Dieterlen 29 ; Drakensberge, Symons 7588 ; Mont aux Sources, McLean and Bayer 201 ; Besters Vley, near Harrismith, Bolus 8138, Flanagan 1864 ; Harrismith, Herb. Alb. Mus. 5142 ; hills near Ladismith, Wood 849 ; Culvers, Weenen district, Rogers ; Johannesburg, Leendertz 1693 ; Irene, Leendertz 695 ; Ermelo, Tennant 6939 ; Potgietersrust, Rogers 5106

Specimens from Xalingena forest, Polela, Natal, Alb. Mus. Herb. 5011, may also be placed here. Others from Ntsubane, near Lusikisiki, Pondoland, Fraser 5149, 5150 have villous leaflets. This is also the case in the young leaflets of Dieterlen 29.

D. Inanda, Natal, 1,800 feet, Wood 742 (Wood says = Gerrard 1403. This number is quoted by Engler under his var. *paucinervis*).

Occasionally one meets with much branched specimens, e.g. Dieterlen 962 from mountain slopes in Basutoland, but as these do not differ otherwise from typical *Rh. discolor* I have refrained from giving them a distinct name.

The following specimens were not classified at the time when they were submitted to me : Dunelm Farm, Fouriesburg, Orange Free State, Potts 3075 ; Bethlehem, Orange Free State, Potts 2999.

Burtt-Davy records *Rh. discolor* from the following additional Transvaal localities : Spion Kop, Ermelo district, Burtt-Davy 8096 ; De Emigratie, Ermelo district, Burtt-Davy 4168 ; Sterkhill, Lydenburg district, Burtt-Davy 481 ; Rietvley, Machadodorp, Burtt-Davy 7085 ; near Carolina, Bolus 11756 ; Spitskop, Pott 4932.

59. **Rh. pondoensis** Schonl. n. sp.

Description : Frutex parvus caule lignoso efoliato repenti ramis erectis aggregatis basi subteretibus sursum angulatis dense foliosis sparse setaceo-pilosis, pilis saepius curvatis. Folia breviter petiolata, petiolis glabris alatis. Foliola coriacea glabra lineari-lanceolata acutissima vel mucronata basi saepius cuneata, margine integra plana conspicue incrassata, costa utrinque valde prominenti, nervis lateralibus numerosis utrinque prominentibus.

Rh. pondoensis Schonl. Wood 3002. Under side.

Rh. pondoensis Schonl. Wood 3002. (Flowers 3/1.)

Paniculae laxae ex axillis foliorum superiorum quam folia paullam longiores vel breviores, bracteis lanceolatis acutis. Calycis segmenta triangularia acuta glabra. Petala flava quam calycis segmenta subduplo longiora. Drupa nitida subglobosa vel ovoidea, stilis persistentibus.

Branches 30–40 cm. high. Length of petioles 1½–3 mm.
Length of terminal leaflets 4–5 cm. Breadth of terminal leaflets 8–10 mm.
Lateral leaflets generally not much shorter than the terminal ones, but slightly narrower.
Length of calyx segments nearly 1 mm.; petals 1¾–2 mm.
Diameter of drupe about 5 mm.

Distribution: Only known from Murchison, Pondoland, where it was collected by the late Mr. J. M. Wood (No. 3002 in Herb. S.A. Mus.). The flower examined was noteworthy. It had a normal ovary with three styles, some stamens were rudimentary, though slightly larger than usual in female flowers of *Rhus*, other stamens were evidently normal and functioning.

There can be no doubt that this species is closely allied to *Rh. discolor* E. Mey., but the subsessile perfectly glabrous leaves seem to differentiate it sufficiently from this very variable species.

TOMENTOSA group.

60. **Rh. tomentosa** L. spec. 382 (non Mill.); Thunb. Prodr. 52, Fl. Cap. ed. Schultes 266; Sonder l.c. 508; Pappe Sylv. Cap. 13; Engler l.c. 407; Diels l.c. 572, 592, 594, 615, 616, fig. 3; 618, 620.

Rh. ellipticum Thunb. Fl. Cap. ed. Schultes 263; *Rh. elliptica* E. Mey. in Drège exsicc.
Rh. bicolor Licht. in Herb. Willd.
Rh. discolor Schrad. hort. Goetting. (ex Sonder).
Rh. Eckloni Schrad. Hort. Goett.
Rh. lobata Poir. in Herb. Berol.
Rh. Plukenetiana E. et Z. in Enum. 1110 (non *Rh. afric.*, etc., Pluk. t. 219, fig. 7).

Description: A shrub or small tree, often 12–15 feet high, branches somewhat patent, branchlets rufous tomentose or pubescent at first, later glabrous, somewhat angular. Leaves petiolate, petioles subterete, slightly furrowed above, usually rather slender. Leaflets coriaceous, dark green or greyish green and glabrous when mature above, covered with dense short greyish or fulvous hairs below, elliptical or ovate, or obovate, acute or acuminate at both ends or obtuse at the apex, sometimes mucronulate, very often petiolulate (petiolules and petioles often reddish); margin flat, entire or very often from above the middle coarsely serrate, teeth acute or obtuse; midrib on upper surface sunk or in the lower part of the leaflets slightly prominent, on lower surface prominent, lateral veins not prominent on upper surface or even sunk, slightly prominent on lower, tertiary veins not visible on either surface or reticulate and plainly visible on upper. Panicles terminal, longer than the leaves, much branched, multiflowered, densely greyish tomentose, bracts linear lanceolate, flowers distinctly pedicelled. Calyx segments ovate, obtuse, villous on the back. Petals oblong, greenish, slightly pilose or pubescent on back. Drupe densely greyish tomentose, compressed and depressed, often somewhat asymmetrical or sometimes subglobose.

Length of petioles 1·5–2 cm.
Length of petiolules up to about 8 mm. in terminal leaflets, shorter or absent in lateral leaflets.
Length of terminal leaflets 5–7 cm., occasionally much smaller.
Breadth of terminal leaflets 1–3·5 cm.
Lateral leaflets generally about two-thirds the size of the terminal leaflets and resembling them.
Length of floral bracts 2–3 mm.; pedicels 1–2 mm.; calyx segments about ¾ mm.; petals 1½ to nearly 2 mm. Greatest diameter of drupe 5–6 mm., smallest 3 mm., height about 4 mm.

Rh. tomentosa L. Zahn (5050). Under side.

Rh. tomentosa L. Zahn (5050). Under side.

Distribution: Common amongst shrubs on the hills and mountains of south-west Cape Province (altitude about 200 feet to about 3,000 feet) from Little Namaqualand to George and then in isolated localities to the Transkei (reaching on the south-eastern mountains an altitude of about 5,000 feet and not descending below about 1,500 feet), also in the Wakkerstroom district, Transvaal. It flowers from June to November. Forester Jordaan, Knysna, notes that the flowers have a most disgustingly offensive smell. Sim, in Forest Flora 195, says that it is seldom of timber size or used for other than firewood purposes. Like many other species of *Rhus* it is known as "Taaibosch" from the bark being used as rough cordage.

This species is often represented in eighteenth century herbaria, and was probably one of the earliest introductions to European gardens of South African plants. In Thunberg's herbarium it is found as *Rh. tomentosa* and as *Rh. elliptica*. In Willdenow's herbarium it appears also as *Rh. tomentosa* and *Rh. bicolor* Licht., much reliance having evidently been placed on the shape of the leaflets. *Rh. lobata* Poir. in Herb. Berol. was based on specimens cultivated at Teneriffe. Ecklon and Zeyher in Enum. 1109, besides the type from south-west Cape Province, distinguished three varieties: *β uitenhagensis* (Uitenhage), *γ sylvatica* (Krakakamma), and *δ swellendamensis* (Swellendam). Sonder (l.c. 509) has the type and a var. *petiolaris* in which the leaflets are elliptic oblong, acute or acuminate at both ends, with long petiolules without, however, separating them geographically. Engler (l.c. 408) besides the type has two varieties: *β petiolaris* Sond. and *γ swellendamensis*. In the last the leaflets are oblong elliptical or lanceolate mucronulate, quite entire. He remarks that, through the last, *Rh. tomentosa* comes very close to *Rh. angustifolia*. As I have stated under *Rh. angustifolia*, the question whether this should be united with *Rh. tomentosa* is, with our present knowledge, entirely a matter of opinion. With the large amount of material which I have examined I am unable to separate the

Rh. tomentosa L. Fourcade 840.

species into distinct varieties or even fairly well-defined forms as the distinctive characters relied upon by various authors may be found on the same plant and in widely separated localities. Coppice shoots have often larger leaves than fruiting branches.

I have in the description of most species not referred to the disk which is usually 5-crenate, though with a tendency to curl so as to become almost 10-crenate. In MacOwan 296 and Schlechter 8634 I found the margin with ten regular blunt teeth, while in *Rh. angustifolia* I found sometimes five acute, divided teeth. I do not know whether these are general reliable distinguishing characters.

Herb. Thunberg; Herb. Willdenow; Burchell 299, 608, 3460, 5491; common on hills near Leeuwfontein, Pearson 3221 (leaflets approaching those of typical *Rh. populifolia* in size and shape); Packhuisberg, Schlechter 8634; Riebeeckskasteel, Zwartland, Ecklon 688 (with narrow leaflets); Sevenweekspoort, Phillips 1424; Cape Peninsula: E. & Z. 1110 (type of *Rh. Plukenetiana* E. et Z.), Worsdell 4119, Ecklon 686, Scholl 750, Bowie 193, Diels 39, 85, 1315, Engler 126, 108, 125*a*, Wilms 3120, 3122, Wolley Dod 1393, Bolus 3491, Marloth 11976, Lichtenstein 196 (*Rh. bicolor* Licht.), Drège 353, MacOwan *sine* No. (narrow leaved), Rogers 11243 (narrow leaved); Hottentotshollandberg, Ecklon 526; Stellenbosch, Ecklon 8 and Potts 2136; common in the mountains of Stellenbosch and Worcester, E. & Z. 1109; on the edge of the forests of the Grootvadersbosch, Swellendam, Z. 2232 and E. and Z. 1109 (type of var. *swellendamensis* E. et Z.); Platteklоof, near Fountain, Muir 482; Albertinia, Rogers 16739 (leaves only about half the usual size, panicles very loosely flowered); George, Rogers 4290; edge of the Knysna forest, Jordaan; Melkhoutkraal, Knysna division, Keet 557; flats, Witte Els bosch, Fourcade 840; margin of forest, Ratelsbosch, Fourcade 20; Hofmansbosch, occasional in river bush, Britten 1310; common in sandy soil at the Storms River Pass, about 3 miles from the coast, Zahn (5050); Humansdorp, under 500 feet, Rogers 2901; Van Stadensberg, E. et Z. 1109 (var. *uitenhagensis* E. et Z.); Rust en Vrede, Oudtshoorn, Dyer 84; Boschberg, c. 3,500 feet, MacOwan 296; hills near Grahamstown, MacOwan 12/1276, Britten 1599, Dyer 70, Daly and Sole 469; Hogsback, about 5,000 feet, Rattray 368; Buffels mountain, near Kingwilliamstown, Tyson 1039; Fort Cunynghame, Sim 262; fairly common 18 miles from Tsolo and 23 miles from Maclear, c. 4,700 feet, Dwyer (5085); Slangapies mountains, Wakkerstroom district, Transvaal, Burtt-Davy 1942.

61. **Rh. angustifolia** L. spec. 382; Thunb. Fl. Cap. ed. Schultes 263; Sonder l.c. 507; Engler l.c. 405; Diels l.c. 571, 592, 617, fig. 4 B, 618; Pluk. Alm. t. 219, fig. 6.

Rh. salicinum Herb. Jacq.; *Rh. argentea* Mill. dict. No. 11.

In the Linnaen herbarium, London, No. 21 is called "*angustifolium*." This is the same plant which Sonder and others call *Rh. angustifolia* L., but No. 27 is also named "*angustifolium*" in the younger Linnaeus' handwriting. This is the same plant which E. et Z. later described as *Rh. stenophylla*. Under *Rh. angustifolium* Linnaeus quotes with his original description Burm. afr. 251, t. 91, fig. 1. This is a bad figure of *Rh. rosmarinifolia* Vahl. Though I have not been able to clear up this matter satisfactorily, I take the species in the sense in which it was taken by Sonder and Engler.

Rh. angustifolia L. Schlechter 5617. Under side.

Rh. angustifolia L. Schlechter 9133. (Flowers 4/1.)

Description : A shrub, usually not more than 4–8 feet high, often with brown branches and with glabrous, pubescent or villous branchlets. Leaves petiolate, petioles subterete. Leaflets coriaceous, petiolulate, narrowly elliptic or lanceolate somewhat tapering at the base, mucronate or rarely emarginate, smooth, shining above, densely covered with short, grey hairs below ; margin entire, flat or slightly recurved ; midrib sunk above, slightly prominent below, lateral veins distinct but not raised above, often not visible below, tertiary veins sometimes very indistinctly seen on upper surface. Panicles terminal and lateral, longer than the leaves (male longer and denser than female), pubescent or more rarely glabrous. Calyx segments ovate acute. Petals oblong. Drupe densely greyish-pilose, compressed, sometimes slightly oblique.

Length of petioles rather variable, usually less than 1 cm., rarely up to 1·5 cm.
Length of terminal leaflets about 5 cm. Breadth of terminal leaflets 6–10 mm.
Lateral leaflets about four-fifths the length of the terminal leaflets and resembling them.
Petiolules of terminal leaflets 4–5 mm. long, those of the lateral ones slightly shorter.
Length of pedicels about 1 mm. ; calyx segments ¾–1 mm. ; petals about 1½ mm.
Greatest diameter of drupe 4–5 mm.

Distribution : Common on slopes of hills (up to 2,000 feet) from Capetown to Caledon, Malmesbury district, Cedarberge, the Pikenierskloof, Hex River, and Swellendam, often on river banks, flowering in spring.

The species exhibits considerable differences in hairiness of young branches, petioles, and panicles, but it cannot be satisfactorily divided into varieties or even fairly well-defined forms. [Engler (l.c. 406) has separated a var. *cinerea* without, however, quoting a type.] There are also variations in the length of the petioles and in the texture and shape of the leaflets, which, however, rarely have a tendency to form short, blunt, toothlike projections. Whether this species should be made a variety of *Rh. tomentosa* is entirely a matter of opinion. As it is circumscribed in its geographical distribution, though overlapped by *Rh. tomentosa*, it is perhaps best to keep it separate, especially as its petioles are always shorter, and even the narrow-leaved forms of *Rh. tomentosa* retain a more oval outline of the leaflets.

Marloth, in Das Kapland, 1908, shows on fig. 14 B the habit of the plant near Palmiet formation. His fig. 24, " Macchia near Stellenbosch ", includes it also.

Herb. Linnaeus (No. 21), London ; Herb. Willd., Berlin ; Cape Peninsula, Bergius, Ecklon 692, E. et Z. 1092 (also near Stellenbosch and Worcester divisions), Z. 4832, Engler 51, Paterson 68 ; French Hoek, Phillips 1086 ; Stellenbosch, Marloth 2822 ; Bainskloof, Schlechter 9133, 9157 ; Breede River valley, near Bainskloof, Bolus 2745 ; Wellington, Marloth 11974*c* ; Caledon, Marloth 11974 *a* and *b* ; River-zonder-einde, Schlechter 5617; Hex River valley, Rehmann 2817, Tyson 776 ; banks of the Buffeljagdsr., Swellendam, Z. 2229 ; river-bed, Naidouwkloof, Pillans 5341 ; overhanging stream east side of Pikeniers Pass, Pearson 5225 ; Hopefield, Malmesbury, Gürke 1566 ; in stony rivulets, Cedarberge, between Pakhuis and Groenberg, Diels 558 (panicle flexuous). Further, the following specimens in Herb. Kew : Drège 6810*a*, Ecklon 689, Cooper 2168, Burchell 248, 7280, Sieber 217.

62. **Rh. incisa** L.f. suppl. 183 ; Thunb. Prodr. 52, Fl. Cap. ed. Schultes 267 ; Sonder l.c. 509 ; Engler l.c. 408 ; Diels l.c. 572, 592, 594, 619, 621 and fig. 5 F, G, H, 621.

Rh. obovata Sond. l.c. 508 ; Engler l.c. 408 ; Diels 571, 592, 615 and fig. 5, E, F, 621.

Rh. sinuata E. et Z. Enum. 1111 (non Thunb.).

Description : A much branched shrub, 3–10 feet high, with rigid spreading branches and small puberulous branchlets. Leaves petiolate, petioles puberulous or rarely canescent, subterete, slightly canaliculate above. Leaflets (in outline) ovate or obovate-cuneate, rarely obtuse, mucronulate, more or less pinnatifid with obtuse lobes or only with small triangular often obtuse teeth in the upper half or quite entire, above dark green, minutely puberulous or velutinous, below whitish tomentose : margin flat or (in the pinnatifid forms often) revolute, midrib sunk on the upper surface and more or less prominent on the lower, lateral veins not raised or even sunk on the upper surface, more or less prominent on the

lower. Panicles tomentose, terminal on short lateral branches bearing clusters of subsessile flowers, generally only slightly longer than the leaves, sometimes much larger and more luxuriant at the end of elongated branchlets. Calyx segments oblong or ovate, tomentose on the outside; petals oblong-ovate, tomentose on the outside. Drupe dry, subglobose, densely villous, eventually dehiscing (always ?).

Length of petiole 3–10 mm.
Length of terminal leaflets 1·5 to 2 cm. (rarely up to 3·5 cm.). Breadth of terminal leaflets 1–1·5 cm.
Lateral leaflets generally a little over half the size of the terminal ones and resembling these.
Length of calyx lobes about 1 mm.; petals about 2 mm.
Diameter of drupe 5–7 mm.

Distribution: Namaqualand, south-west Cape Province and scattered in open scrub in the coast districts to Komgha, favouring situations near river banks and flowering from July to October.

Rh. incisa and *Rh. obovata* have been kept separate by Ecklon and Zeyher (who wrongly applied the name *Rh. sinuata* to the latter), Sonder, Engler and Diels. It is true that extreme forms seem to be quite distinct on account of the pinnatifid leaflets of the former as contracted with the entire or subentire leaflets of *Rh. obovata*. As long as little material was available, the geographical distribution seemed to confirm this view. Even now forms with pinnatifid leaflets are unknown to me from Riversdale eastwards. On the other hand, plants with more or less entire leaflets occur as far as Namaqualand, e.g. in Drège 6793 *b*, Schlechter 5095, 7854, E. & Z. 1112. Marloth, in "Das Kapland" (1908) 291, stated with reference to *Rh. obovata*, that it is common on mountainous parts near O'okiep and Steinkopf in Namaqualand (where, as he informed me later, stock feeds on it). The amount of dissection of the leaflets may vary considerably on the same plant. Under the circumstances one can only consider these two so-called species as local forms which may be distinguished as follows (but it must be understood that isolated branches of A may be practically indistinguishable from B):—

A. *typica*.—Leaflets more or less pinnatifid or nearly entire, often with the lateral veins very prominent on the lower surface, margin usually revolute. Drupe about 5 mm. in diameter. South-west Cape Province (extending to the macchia of the Bokkeveld) and Namaqualand.

Rh. incisa L.f., A. *typica*. Schlechter 4991*a*.

Rh. incisa L.f. Schlechter 7854. Upper side.

B. *obovata*.—Leaflets entire or with small teeth at the apex, lateral veins rarely prominent on the lower surface, margin flat. Drupe 6–7 mm. in diameter. From Riversdale to Komgha. (Engler rightly remarks that in non-flowering branchlets the leaflets are sometimes much longer than usual, more dentate, and the petioles are longer.)

Rh. incisa L.f., B. *obovata*. Britten 1532. Upper side.

A. Herb. Thunberg; Clanwilliam, on the Olifants River and near Brakfontein, Drège; Olifants River, 500–1,000 feet, Schlechter 4991, 8720; Clanwilliam district, Bachmann 711, Schlechter 8720, Diels 279. E. & Z. 1112, Marloth 2618, MacOwan 3311; Namaqualand, Marloth 6715, 6767 (p. pte.), 11153; Bolus 6527, Scully 42, Pearson 6530; mountains above Worcester, Rehmann 2518; between Paarlberg and Paardeberg, Drège 6793*b*; Hex River mountains, Drège 277 (wrongly issued as *Rh. tomentosa* L.); Saron, Schlechter 7854; Simonstown, 1,000–2,000 feet, E. et Z. (this locality requires confirmation).

B. Drège 6794*aa*, Burchell 2194, 3011, 3332, 3499, 3824, 4802 in Herb. Kew; banks of Zoutmelks River, Riversdale, 600 feet, Muir 2473; Gauritz River, Gamtoos River, and Assegaibosch (Albany), E. et Z. 1111; Assegaibosch (Humansdorp), Rogers 2841; between Gamtoos and Kromme Rivers, 118 miles north-west of Humansdorp, Fourcade 413; flats east of Kabeljauws River, near mouth, Fourcade 721; scrub near Gamtoos River, 200 feet, Schlechter 6039; Port Elizabeth, 100 feet, Tyson 2261; mountain sides near Graaff-Reinet, 4,000 feet, Bolus 625; Alicedale, Cruden 40, 78; hills near Bushman and Kareiga River, Z. 2240; between Port Alfred and the Kasouga, not far from the Kasouga mouth, Britten 2260; near Grahamstown, 1,200–2,300 feet, Schonland 574, 3293, MacOwan 34, 164, Britten 1532, 1597. Daly and Sole 303; Buffalo mountain, near Kingwilliamstown, 3,000 feet, Tyson 1038; British Kaffraria, Cooper 42, 421; woods and shrubby places, Prospect farm, near Komgha, Flanagan 292 (in these specimens the leaves are a little longer and relatively narrower than usual and often shortly mucronulate).

63. **Rh. rosmarinifolia** Vahl Symb. III, 30; Willd. sp. I, 1484; Thunb. Fl. Cap. ed. Schultes 262; E. et Z. in Enum. 1088; Sonder l.c. 506; Engler l.c. 404; Diels l.c. 570, 592, 617, fig. 4 E, 618; Burm. Afr. 251, t. 91, fig. 1.

Rh. stenophylla E. et Z. in Enum. 1094; Sonder l.c. 509; Engler l.c. 404; Diels l.c. 571, 592, 594, 617, fig. 4 C, 618.

Rh. lavandulaefolia Presl Bot. Bem. 42.

Rh. angustifolium in Herb. Linnaeus (non Linn.).

Rh. macrocarpa Engl. l.c. 449.

Description: A shrub, 2–4 feet high, with virgate branches and glabrous or puberulous branchlets. Leaves shortly petiolate. Leaflets straight or curved, narrowly linear or linear lanceolate; acute on both ends, sometimes mucronate, glabrous and shining above, whitish-tomentose below, with the exception of the midrib; margin revolute, entire or with one or more sharp teeth; midrib sunk on the upper surface, prominent below, lateral veins deeply sunk on upper surface, rarely visible on lower, tertiary veins not visible. Panicles lateral and terminal, the latter generally longer than the leaves, glabrous, sparsely pilose or pubescent, multiflowered, bracts subulate, flowers shortly pedicellate. Calyx segments ovate acute, subacute or obtuse, sometimes pilose, petals oblong. Drupe large, subglobose, a little compressed, usually whitish or ferruginous tomentose, rarely glabrous.

Rh. rosmarinifolia Vahl. E. and Z. 1088 (flowers enlarged).

Length of petioles generally 5–8 mm.
Length of terminal leaflets 2–5 cm. long, rarely longer.
Breadth of terminal leaflets 1–2 mm., in var. B. up to 5 mm. or even more.
Lateral leaflets generally about four-fifths the size of terminal leaflets and very much like them.
Length of calyx segments about ¾–1 mm.; petals about 2–2¼ mm.
Greatest diameter of drupe 8–10 mm.

DISTRIBUTION: This species, the smallest of the south-west species of *Rhus*, is almost always present on hill-heathland, and extends under similar conditions to Port Elizabeth. (Drège, in Herb. S.A. Mus., is labelled "inter Shiloh et Los Tafelberg Dec. 47". This locality is, without doubt, wrong.)

Flowers mainly in winter.

Diels (l.c. 618) points out that there are only artificial limits drawn between *Rh. rosmarinifolia* Vahl and *Rh. stenophylla* E. et Z. The latter is only a broader leaved variety of the former, as was already suggested by Sonder (l.c. 507). Ecklon and Zeyher in Enum. 1088, divide *Rh. rosmarinifolia* into the following four varieties. They evidently did not realize that their No. 1094, which they described as *Rh. stenophylla*, is very closely allied to it, and placed it between *Rh. rufescens* E. et Z. [=*Rh. discolor*], and the plant which they wrongly called *Rh. tridactyla* Burch. [=*Rh. eckloniana* Sond.].

α capensis.—Leaflets linear, sessile, very long. Amongst shrubs, north and east side of Table Mountain (alt. II), Hottentots Holland Mountain, flowering May, June.

β uitenhagensis.—Leaflets linear, petiolate, very long. In stony places (alt. II) mountain sides of the Zuurberg and Van Stadens (Uitenhage), flowering July.

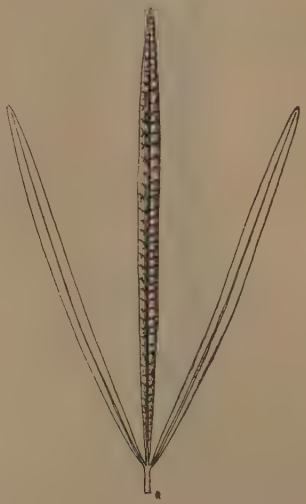
γ caledonica.—Leaflets petioled, linear, very short. In stony places (alt. IV) mountain sides on the Zwarte- and Baviaansberg, near Genadendal (Caledon), flowering June.

δ swellendamensis.—Leaflets shorter, linear-lanceolate. Mountain sides along the Rivier-zonder-einde (alt. II), Swellendam, flowering May. They add: "perhaps a distinct species".

I propose to divide the species into three varieties:—

A. *typica.*—Leaflets narrow linear, acute or mucronate, panicles glabrous.

B. *stenophylla.*—Leaflets linear-lanceolate or oblanceolate, acuminate, mucronate, up to about 7 mm. broad (in the type, E. et Z. 1094, some are 5 mm. broad and 4 cm. long, others on the same branch are only 1½ mm. broad).



Rh. rosmarinifolia Vahl.; B. *stenophylla*. 5/2. Paterson 2269. Upper side.

C. *brevifolia.*—Leaflets elliptico-lanceolate, acute or paucidentate at the top, c. 15 mm. long, 2·5–4 mm. broad.

A sharp distinction between these varieties is not possible, and it may be that some relatively broad leaved specimens are hybrids between *Rh. rosmarinifolia* and *Rh. angustifolia* L.

Schlechter 7872 (Saron, 600 feet, flowering June) was looked upon by the collector as a hybrid between *Rh. rosmarinifolia* and *Rh. dissecta.*

A. *typica.*—Herb, Thunberg fol. α; Herb. Willdenow; on the sides of Table Mountain and Hottentots Holland Mountains (var. *capensis* E. et Z.); other specimens from the Cape Peninsula: Ecklon 1, Schlechter 769, 1227, Z. 4279, Wolley Dod 1095, 2501, Cooper 2492, Pappe, Prior, Ecklon 6099; Piquetberg, Drège 6812; Dal Josaphat, Tyson 847; stony places in the third altitude on the Zwartebergen and the Baviaans River, near Genadendal, E, et Z. 1088 (var. *caledonica* E. et Z.); stony places on the Van Stadens mountain, Z. 2227 (this shades into B as do also the following:) Port Elizabeth golf course, Cruden 417, Kemsley 167; near Redhouse, Paterson 2269; Burchell 451, 873, 943, 6374, 8374, 8535 in Herb. Kew.

Rh. lavandulaefolia Presl Bot. Bem. 42 (in Herb. Berol.) is a form with long narrow leaflets which are strongly curved. Rehmann 1346, from Stinkwater, Capetown, must be referred to it. The leaflets reach a length of 5–6 cm., while they are barely 1 mm. broad.

B. *stenophylla.*—Herb. Thunberg fol. β and γ; Herb. Linneaus No. 27; stony places east side of Table Mountain, E. et Z. 1094 (type of *Rh. stenophylla* E. et Z.); Lions Head, Wilms 3127; above the blockhouse, Capetown, Wolley Dod 36; Prince Alfreds Pass, 2,400 feet, Fourcade 1281; stony places at Van Stadens mountain, MacOwan 1030; Port Elizabeth, J. L. Drège; Burchell 4470, 4528, 6766, Z. 331 in Herb. Kew.

In Sieber 216 (Cape Peninsula ?) the breadth of leaves is extraordinarily variable, one is 1 cm. broad. Some specimens in Herb. S.A. Mus. distributed by Ecklon and Zeyher under 1094 as *Rh. stenophylla* δ *swellendamensis* have rather long petioles (up to 1 cm.), and the shape and size of the leaves varies also considerably.

C. *brevifolia.*—Mountain sides near Rivier-zonder-einde, Swellendam, E. and Z. *sine* No. in Herb. S.A. Mus. (var. *swellendamensis* E. et Z.); Caledon, ? in Herb. S.A. Mus.

Rh. macrocarpa Engl. l.c. 449; Diels l.c. 591, 592, 517, fig. 40.

This is only known from Burchell 6756, 6758, collected on the Zoutmelksrivier, near Riversdale. In the Kew Herbarium it was placed by Sonder under *Rh. stenophylla* E. & Z. It is only distinguished from *Rh. rosmarinifolia* Vahl C *brevifolia* by perfectly glabrous drupes, but already Diels (l.c. 592) has pointed out that the haircovering of the fruit in *Rh. rosmarinifolia* is not constant. He found on a specimen collected by Mundt and Maire (on the Cape Peninsula ?) that the young carpels and consequently the fruitwall were perfectly glabrous. The absence of a haircovering on the fruit alone can, therefore, be scarcely looked upon as a specific difference.

POPULIFOLIA group.

64. **Rh. populifolia** E. Mey. in Drège exsicc.; Sonder l.c. 508; Engler l.c. 407; Diels l.c. 571, 592, 622.

Rh. Steingroeveri Engl. Bot. Jahrb. XXIV, 500; Diels l.c. 572, 592, 621, fig. 5 A.

Description: A much branched shrub, 5–10 feet high, with glabrous or puberulous branchlets. Leaves petiolate, petioles slightly furrowed above and slightly winged. Leaflets subcoriaceous, often very shortly petiolulate, rhombeo-suborbiculate, triangulate or subovate, cuneate at the base, obtuse at the apex, dark green, subglabrous above, greyish or greyish-red tomentose below; margin flat, usually crenato-dentate or entire; midrib and lateral veins yellowish and not prominent (or even sunk) above, prominent below, tertiary veins few and distinct below. Panicles puberulous, lateral and terminal, shorter than the leaves with pedicelled flowers. Calyx segments ovate subacute, petals oblong. Drupe tricuspidate, obliquely depressed and compressed, sometimes slightly verrucose, puberulous or glabrous when ripe.

Length of petiole about 1 cm.
Length of terminal leaflets usually 1·3–3·5 cm. Breadth of terminal leaflets 2–3 cm.
Lateral leaflets about two-thirds the size of the terminal leaflets.
Length of calyx segments $\frac{1}{4}$–$\frac{1}{2}$ mm.; petals about 1·5 mm.
Greatest diameter of fruit 5–6 mm.

Distribution: Namaqualand, Bushmanland, South-West Protectorate.

Already Diels (l.c. 572) has stated that *Rh. Steingroeveri* Engl. can only be distinguished from *Rh. populifolia* E. Mey. by smaller size of the leaflets and sometimes by the shape of the leaflets. I do not see any reason, therefore, to keep up Engler's species. The leaflets sometimes approach those of the form of *Rh. incisa*, which is known as *Rh. obovata* Sond. Sonder says that the fruit is tipped by the styles, but it is more than that. The styles enlarge slightly and form small spines as in a few other South African species of *Rhus* (the fruits distributed with Pearson 4465 and 4695 do not belong here and not even to the genus *Rhus*). Flowers June, July.

Rh. populifolia E. Mey.; *forma*.
Schlechter 11438.
Under side.

Rh. populifolia E. Mey. Phillips 8963.

Mouth of Orange River, Drège (in Herb. Kew); rocky places on the Orange River, first alt., Drège 3032; Aus, Steingroever 56, 51 (in Herb. Berol.) (type of *Rh. Steingroeveri* Engl.); amongst rocks near spring at Karibis, Warmbad district, 900 m., Marloth 4793; hills near Wolveton, Schlechter 11438 (too

Rh. dissecta Thunb. Mader.
Upper side.

Rh. dissecta Thunb., A. *obovata*. female. Tyson 635 (female).
(Flowers 4/1.)

Rh. dissecta Thunb., A. *obovata*. Tyson 635 (male, flowers enlarged).

scrappy); Steinkopf, Namaqualand, Marloth 6767 (p. pte.); Namaqualand and Bushmanland, between Steinkopf and the Orange River, Phillips 1568; Bushmanland, 2,700 feet, Pearson 4695; sand at foot of Gesellschaftsbank, 2,700 feet, forming thickets, Pearson 4695; Great Namaqualand, Pearson 4017, 5263, 4465, 6164; South-West Protectorate (in Herb. Berol.), in the coast desert and on hills up to 3,000 feet: Hermann 20, Range 416, 833 (in one branch leaflets narrowly ovate up to 5 cm. long and 3·2 cm. broad), 1080, 1171, Schulze 100.

65. **Rh. dissecta** Thunb. Fl. Cap., ed. Schultes 267; Sonder l.c. 509; Engler l.c., Diels l.c. 572, 592, 622, fig. 5 B, C, D.

Rh. argentea E. et Z. in Enum. 1127.

Description: A shrub, 5–6 feet high, with terete, glabrous, reddish brown, sometimes filiform branchlets. Leaves petiolate, petioles often reddish, slender, subterete. Leaflets coriaceous, glabrous and dark green above, greyish tomentose (except on midrib and veins) below, more or less obovate in upper part, strongly contracted and narrowly obcuneate in lower part; margin slightly thickened and often slightly revolute, entire in lower part, sharply cut in upper part with teeth generally triangular, mucronate, or leaflets pinnatifid; midrib and lateral veins yellowish and barely raised on the upper surface, pale reddish and prominent on the lower, tertiary veins not visible. Panicles glabrous, loose and few-flowered, terminal on short lateral branches, bracts subulate, acute, flowers pedicelled. Calyx segments oblong-triangular, obtuse, petals oblong. Drupe glabrous, oblique, depressed and compressed, shining, more or less verrucose, tricuspidate.

Length of petioles 1·2–2·4 cm.
Length of terminal leaflets 8–1·5 cm. Breadth of terminal leaflets 5–12 mm.
Lateral leaflets about two-thirds the size of the terminal leaflets.
Length of pedicels 1–2½ mm.; calyx segments ¾–1 mm.; petals 1¾–2¼ mm.
Greatest diameter of drupe 6–8 mm.

Distribution: From north of the Olifants River through the Clanwilliam district, Malmesbury district, Hex River valley. Flowers in winter and spring.

This species is nearest to *Rh. populifolia* E. Mey. as shown by its drupe. The venation of leaves in both is also very similar. Sonder (l.c. 509) distinguishes two varieties, to which the following names may be given, though a sharp line cannot be drawn between them :—

A. *obovata*.—"Leaflets obovate or suborbiculate, cuneate, incised dentate" (*Rh. argentea* E. et Z. 1127; *Rh. dissecta* E. Mey. in Drège exsicc.).

B. *pinnatifida*.—"Leaflets pinnatifid, lobes lanceolate, acute" (*Rh. dissecta* Thunb., E. et Z. 1128; E. Mey. *a* and *f*).

A. *obovata*.—Burchell 992, 7460, in Herb. Kew; Giftberg, common, 2,000 feet, Phillips 7529; banks of Olifants River, 400 feet, Schlechter 5027*a*, Stephens 7123; Clanwilliam, Mader, Schlechter 1637, Diels 280; stony places above Wupperthal, MacOwan 3273; swampy ground, mountain sides near Brakfontein, Clanwilliam, E. & Z. 1127 ("Corynthebosses") (this is the type of *Rh. argentea* E. et Z. and includes their var. *brevifolia*, in which the leaflets are a little smaller and not so sharply cut as in the type); between Pikenierskloof and Clanwilliam, Z. 232; Cedarberge, near Groenberg, c. 2,500 feet, Diels 860; Piquetberg, Edwards 193, Bolus 13530; near Groenekloof, Bolus 4265; Kradouw Krantz, Pillans 5,300; Klitzkop, near Darling, Bachmann 608, 1564; Moorreesburg, Bachmann 1562; Waterboerskraal, Malmesbury, Bachmann 1563; hills near Malmesbury, Schlechter 167; near Hopefield, Bachmann 1802; Hex River valley, at the foot of the mountains, Engler 273, Rehmann 2821, Tyson 635.

B. *pinnatifida*.—Herb. Thunberg; Groenekloof, Pappe 10; Nieuwekloof, 1,500 feet, Schlechter 7504; Saron, 1,000 feet, Schlechter 7861; ib., 600 feet, Schlechter 7872 (Schlechter has marked this "*Rh. rosmarinifolia* X *dissecta*").

66. **Rh. cuneifolia** Thunb. Prodr. 52, Fl. Cap. ed. Schultes 267; Sonder l.c. 512; Engler l.c. 419; Diels l.c. 576, 637, fig. 8 A, B, C.

Description: An erect shrub with terete or slightly angulate, sometimes purplish, minutely puberulous branchlets. Leaves shortly petiolate or subsessile. Leaflets coriaceous, glabrous, obcuneate, obovate-cuneate or subrhomboid, margin thickened and slightly

Rh. cuneifolia Thunb. Schlechter 4824.
Under side.

Rh. cuneifolia Thunb. Herb. MacOwan 1795. (Flowers enlarged.)

revolute, entire except in upper part which is grossly dentate, teeth acute or acuminate, sometimes mucronulate; midrib and lateral veins slightly prominent on the upper surface, more so on the lower, tertiary veins not visible. Panicles axillary and terminal, pilose, the female about as long as the leaves, the male much longer, rather loose, flowers pedicelled. Calyx segments ovate, subacute, petals oblong. Drupe obliquely ovoid, depressed and compressed, shining, tricuspidate.

Length of petioles ½–3 mm.
Length of terminal leaflets 1·2–1·5 cm. Breadth of terminal leaflets 8–10 mm.
Lateral leaflets one-half to two-thirds the length of the terminal leaflets and resembling them, but often asymmetrical.
Length of pedicels about 1 mm.; calyx segments barely ½ mm.; petals about 1¼ mm.
Greatest diameter of drupe about 6 mm.

Distribution: Caledon district, Stellenbosch district, and Clanwilliam, in rocky situations. Marloth (Das Kapland, p. 261) also quotes it from the Guarri formation, Montagu, Oudtshoorn, Ladismith, north side of the Zwartebergen. Flowers in spring.

Diels (l.c. 577) says that there are transitions between this and *Rh. scytophylla* E. & Z., but this applies only to the shape of the leaflets. I am inclined to place it close to *Rh. dissecta* Thunb., with which it agrees in the fruit and the venation of the leaflets.

Herb. Thunberg; Burchell 8197, 8244, 8288, Pearson 7782 in Herb. Kew; Zwarteberg, Caledon, Ecklon 37 (*Rh. africana* Ecklon non Mill.); Hottentotshollandsbergen, near Grictjesgat and Steenbrass River (Stellenbosch) in Langehoogde, and near Bontjeskraal (Caledon), E. and Z. 1131; near Caledon warmbaths, 1,000 feet, MacOwan 2795; Howhoek, c. 1,500 feet, Bolus 9191; Sir Lowry's Pass, Schlechter 4824; near Clanwilliam, Leipoldt in Herb. MacOwan 2795.

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The Genus Psoralea Linn.

By HELENA M. L. FORBES, Natal Herbarium, Durban.

The South African species of the genus *Psoralea* were last monographed by Harvey in Harvey and Sonder's "Flora Capensis" (Vol. II) and since then much fresh material has accumulated in the South African Herbaria. As the genus is a fairly typical representative of the family, especially in the South-Western portion of the Cape Province, it was suggested to the writer that the local material be brought up to date. The Curators of the Bolus Herbarium, the National Herbarium, and the herbaria of the Albany and South African Museums very kindly placed their respective collections at the disposal of the writer. Archdeacon F. A. Rogers also allowed use to be made of his private collection. The writer is also indebted to Dr. I. B. Pole Evans, C.M.G., for granting facilities to undertake the work, and to Dr. E. P. Phillips for assistance and criticism.

The genus *Psoralea* comprises a large group of shrubs and herbs belonging to the sub-order *Papilionaceae* of the family *Leguminosae*. The species, numbering about 124, are found throughout the tropical and sub-tropical parts of the world, and of these, 49 occur in South Africa. Most of the species occur in the south-western districts of the Cape Province, but extend through the south-eastern districts into the Transkei and Natal. The majority of the Transvaal species are found in the northern spurs of the Drakensbergen, a few in the western districts. With one or two exceptions, the genus is not represented in the Karoo proper, nor in the north-western districts of the Cape Province, and but few species have been recorded from Namaqualand and South West Africa.

The habit of the species varies considerably: some attain a height of 15 feet, while others are low shrubs or diffuse herbs, while at least one species forms a dense cushion-like growth. A characteristic feature of the genus is the presence of resinous glands on practically every part of the plant. With the exception of *P. biovulata*, all the species are uni-ovulate. The flowers are blue, purple, or rarely yellow, and the majority of the species have sweetly-scented flowers.

PSORALEA (Linn.).

From "*The Genera of South African Flowering Plants*," by E. P. Phillips.

Calyx gland-dotted, sub-equally lobed, or the lowest segment the largest; the upper segments often connate. *Standard* ovate or orbicular, clawed, with inflexed sides; wings oblong, sub-falcate; keel incurved, obtuse, shorter than the standard. *Stamens* diadelphous; the vexillary stamen free or more or less connate with the others; anthers uniform or the alternate fixed higher. *Ovary* sessile or shortly stalked, 1-ovuled, in 1 species 2-ovuled; style filiform or dilated at the base, incurved above; stigma terminal. *Pod* ovate, indehiscent, concealed in the calyx. *Seed* without an appendage; funicle very short.

Herbs, shrubs or undershrubs; leaves gland-dotted, digitately 3 to many-foliate, pinnate or 1-foliate; stipules embracing the branches, scarcely adnate to the petiole; inflorescence a head, spike or raceme, axillary or terminal, or flowers fascicled or rarely solitary; bracts 2–3; bracteoles 0.

KEY TO SPECIES.

1. Leaves reduced or apparently absent, or leaflets filiform or linear to linear obovate, not much broadened from the base upwards 2
   Leaflets obovate, oblanceolate or elliptic, broader at the apex than at the base 22
2. Leaves much reduced, never 5 mm. long 3
   Leaflets long-linear, sometimes reduced to a single leaflet, but usually over 1 cm. long 4
3. Calyx pilose within ..... 1 *aphylla.*
   Calyx glabrous within; ovary 2-ovuled ..... 2 *biovulata.*
4. Stipules connate, forming a tubular sheath enclosing the petiole 5
   Stipules free or slightly connate, not forming a tubular sheath 6
5. Stipules with two short tooth-like points, leaflets sometimes solitary .... 3 *restioides.*
   Stipules with two long acuminate points, often exceeding 1 cm. in length. 4 *fascicularis.*
6. Leaflets 3, or leaves reduced to 1 leaflet 7
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7. Leaves unifoliate ..... 5 *Guenzii.*
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15. Glands immersed in leaves ..... 10 *polyphylla.*
    Glands not immersed ..... 11 *Mundtiana.*
16. Leaflets pellucid-dotted ..... 12 *candicans.*
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17. Calyx glabrous within ..... 14 *triantha.*
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18. Vexillum geniculate with two slight appendages at apex of the claw .... 16 *oreophila.*
    Vexillum not geniculate; no appendages ..... 17 *glaucina.*
19. Leaves glabrous ..... 18 *tenuissima.*
    Leaves densely hirsute when young, never quite glabrous ..... 19 *odoratissima.*
13. Leaves not exceeding 5 mm. in length 20
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20. Leaves on petioles up to 2 cm. in length ..... 20 *pinnata.*
    Leaves on petioles up to 1 cm. in length ..... 21 *affinis.*
8. Leaves with 5–7 pairs of leaflets; flowers white 22
   Leaves with 2–5 pairs of leaflets; flowers blue 23
21. Pedicels up to 2·5 cm. long, with connate bracts seldom exceeding 1 mm. in length ..... 22 *repens.*
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    Inflorescence axillary, racemose, calyx-tube and lobes marked with purple striae ..... 26 *argenta.*
29. Leaves nigro-punctate, pubescent ..... 27 *biflora.*
    Leaves pellucid-dotted, canescent ..... 28 *obtusifolia.*
27. Peduncles with 2 sessile flowers 30
    Peduncles with 3 or more shortly pedicelled flowers 31
24. Leaves unifoliate ..... 29 *rotundifolia.*
    Leaves trifoliolate ..... 30 *Thomii*
30. Leaves glabrous
    Leaves hispid

31. Calyx glabrous 32
Calyx pubescent 33
32. Stipules persistent; leaflets with a recurved mucro ..... 31 *aculeata.*
Stipules not persistent; leaflets mucronulate ..... 32 *Keetii.*
33. Flowers 1–3 together, axillary 34
Flowers in terminal or axillary heads or spikes 35
34. Leaflets with a recurved mucro 36
Leaflets with fine mucro, or none at all 37
36. Leaflets nigro-punctate ..... 33 *polysticta.*
Leaflets pellucid-dotted ..... 34 *carnea.*
37. Leaflets elliptic-oblong; lateral leaflets unequal sided ..... 35 *obliqua.*
Leaflets cuneate; with prominent wart-like glands on the lower surface. 36 *macradenia.*
35. Inflorescence on peduncles exceeding 3 mm. long 38
Inflorescence sessile or on peduncles up to 3 cm. long 39
38. Peduncles exceeding 10 cm 40
Peduncles not exceeding 10 cm 41
40. Leaves densely canescent on the lower surface; heads globose on peduncles up to 14 cm ..... 37 *tomentosa.*
Leaves glabrescent; inflorescence a compound spike on peduncles up to 16 cm ..... 38 *Zeyheri.*
41. Margin of leaflets dentate-crenulate ..... 39 *Patersoniae.*
Margin of leaflets entire 42
42. Flowers in groups of 3 on short axillary and terminal peduncles 43
Flowers in lax whorls of 3–5 on rigid woody axillary and terminal peduncles 44
43. Terminal leaflet on petiole up to 1 cm. long; apex rounded ..... 40 *caffra.*
Terminal leaflet sub-sessile, obtuse ..... 41 *venusta.*
44. Leaves and stems silky canescent ..... 42 *hirta.*
Leaves and stems roughly hirsute ..... 43 *stachydis.*
39. Ovary glabrous 45
Ovary pilose 46
45. Leaves densely nigro-punctate on both surfaces ..... 44 *spicata.*
Leaves sparsely glandular; glands near margins ..... 45 *racemosa.*
46. Spikes sessile 47
Spikes on peduncles up to 2·5 cm 48
47. Leaves obovate, hooked at the apex ..... 46 *hamata.*
Leaves oblanceolate, flat ..... 47 *Wilmsii.*
48. Leaves, etc., canescent; mucro recurved ..... 48 *striata.*
Pubescence yellowish; leaves mucronulate ..... 49 *Royffei.*

1. **P. aphylla** Linn.

A tall erect virgate shrub up to 30 metres with drooping branches. *Stems* glabrescent, glandular, canescent when young. *Leaves* unifoliate, 5–17 mm. long, linear, acute; present only on very young stems, their place on older stems being taken by ovate acute bracts up to 5 mm. long. *Stipules* adnate to the base of the petiole, up to 3 mm. long, filiform, acute. *Flowers* axillary, 1–3 subtended by a bract. *Pedicels* bracteolate about the middle, with scattered black hairs on upper portion. *Bracts* up to 5 mm. long, connate, bi-lobed, acute, glandular, pilose. *Calyx-tube* 2·5–6 mm. long, 6–10 mm. in diameter, 10 nerved, glandular, glabrous to nigro-hirsute; lobes linear-lanceolate to lanceolate-ovate, acute, glandular, ciliate, glabrous or laxly nigro-hirsute; shortly pilose on the inner surface; upper and lateral lobes 2–6 mm. long, 1–2 mm. broad; slightly sub-falcate; lowest lobe 4–12 mm. long, 1·5–8 mm. broad. *Vexillum* 7–14 mm. long, 6–15 mm. broad, obovate or sub-orbicular, geniculate, shading from white to deep blue; claw 1–4 mm. long, with two small appendages at the apex; alae pure white, 7–12 mm. long, 2–8 mm. broad, with a linear claw 2–5 mm. long; carina with a deep blue blotch at the apex, 5–9 mm. long, 3–6 mm. broad, with a linear claw 2–7 mm. long. *Ovary* glabrous; style 6–9 mm. long, glabrous.

Flowers: June–January.

Cape.—Clanwilliam district: Klavoer, *Wolley Dod* 298; Piquetberg district: Piquetberg, *Edwards* 248; Worcester district: Mitchell's Pass, *Bolus* 2607; Tulbagh district: Waterfall, *Ecklon* and *Zeyher*; *Rogers* 17395; Cape district: Table Mountain, *MacOwan* 924; *Bolus*; *Ecklon* and *Zeyher* 1530; *Galpin* 3695, *Ecklon* and *Zeyher*, *Forbes*

140; Wynberg, *Wolley Dod* 21; Wynberg and Kalk Bay, *Bolus* 2607; Camps Bay, *Rogers* 3022 without precise locality, *Wolley Dod* 2257; Caledon district: Steenbras, *Moss* and *Rogers* 1540; *Rogers* 10510; Zwart Berg, *Galpin* 3694; Mossel River, *Potts* 1586; Riversdale District: Riversdale, *Schlechter* 1881.

2. P. biovulata Bolus.

A small slender shrub. *Stems* ·3–·6 mm. long, slender, thinly canescent when young, becoming glabrescent. *Leaves* up to 6 mm. long, resembling scales, adpressed, exstipulate, rigid, few, linear-acuminate or subulate, glabrescent, ciliate, with incurved margins. *Flowers* terminal, 1–3 together on short pedicels or subsessile. *Pedicels* bracteate. *Calyx-tube* up to 1·5 mm. long, 3 mm. in diameter, pilose with short silky white hairs, 10-nerved; lobes unequal, lanceolate, acuminate, ciliate, minutely glandular, glabrous on the inner surface; 2 lobes 1–1·5 mm. long, about 5 mm. broad; 3 lobes 2–3 mm. long, 0·5–1 mm. broad. *Vexillum* 4 mm. long, 5–6 mm. broad, broadly obovate, with a short claw 1 mm. long; alae 4–5 mm. long, 2 mm. broad, with a linear claw 1·5 mm. long; carina 3–3·5 mm. long, 2 mm. broad, with a linear claw 1·5 mm. long. *Ovary* pilose, 2 ovuled; style 3 mm. long, pilose.

Flowered: October.

Cape.—Bredasdorp district: Mount Elim, *Bolus* 6902.

3. P. restioides E. and Z.

A slender trailing suffruticose. *Stems* up to ·6 m. long, glabrous, glandular, striate. *Leaves* unifoliolate, rarely trifoliolate, petiolate, stipulate; petioles up to 1·5 cm. long; leaflets 0·5–3 cm. long, scarcely 1 mm. broad, subsessile, filiform, mucronulate, glabrous, glandular. *Stipules* adnate to the base of the petiole; up to 1·1 cm. long, stem-clasping, glandular. *Flowers* solitary, axillary, pedicellate. *Pedicels* up to 1 cm. long, bracteolate about the middle. *Bracts* membraneous, tri-lobed, glandular, ciliate; 1 lobe short; 2 lobes up to 6 mm. long, acute, filiform, sub-falcate. *Calyx-tube* 2–4 mm. long, 4–7 mm. in diameter, glabrous, glandular; lobes unequal, lanceolate, ciliate, glandular, glabrous, shortly nigro-hirsute on the inner surface; upper and lateral lobes 1–4 mm. long, 0·4–1·5 mm. broad; lowest lobe 4–6 mm. long, 1–2 mm. broad, subulate. *Vexillum* 5–7 mm. long, 5–8 mm. broad, obovate, with a linear claw 1·5–3 mm. long; alae 5–6·5 mm. long, 1·5–2·5 mm. broad, with a linear claw 2–3 mm. long; carina 3–4 mm. long, 1 2 mm. broad, with a linear claw 2·5–4 mm. long. *Ovary* glabrous; style 3–4 mm. long, glabrous.

Flowered: August–December. Flowers: Violet-blue.

Cape.—Clanwilliam district: Vogelgat, *Schlechter* 9529; Cape district: Muizenberg, *Bolus* 4271, *Wolley Dod* 2566; Table Mountain, *Bolus* 4504, *Wolley Dod* 795; Caledon district: Klein River, *Ecklon* and *Zeyher*, Hermanus, *Burtt-Davy*, *Bolus* 9841; Bredasdorp district: Elim, *Bolus* 6901, *Bodkin*; Riversdale district: Riversdale, *Rogers* 4394, *Muir* 794, Langeberg, *Schlechter* 2153; Mossel Bay district: Mossel Bay, *Potts*.

4. P. fascicularis D.C.

Plants suffruticose. *Stems* up to 6 metres, slender, diffuse or ascending, glabrous. *Leaves* trifoliolate, sometimes unifoliolate; leaflets 1–3 cm. long, linear-lanceolate, apex very acute; petioles up to 2·5 cm. long. *Stipules* adnate to the petiole, stem-clasping, up to 3 cm. long; points of stipules 1–3 cm. long, subulate, acute. *Flowers* axillary, solitary, or several together. *Pedicels* up to 6 mm. long, axillary, solitary or several together. *Calyx-tube* 2 mm. long, 5 mm. in diameter, glandular, glabrous; lobes linear-lanceolate, acute, glabrous, ciliate, nigro-hirsute on the inner surface; upper and lateral lobes 2–3 mm. long, up to 1 mm. broad; lowest lobe 5 mm. long, 1 mm. broad. *Vexillum* 5 6 mm. long, 4–5 mm. broad, obovate with a linear claw 2 mm. long; carina 3–3·5 mm. long, 1·5 mm. broad, with a claw 2 mm. long; alae 5 mm. long, 1·5–2 mm. broad, with a claw 2 mm. long. *Ovary* glabrous; style 3–4 mm. long, glabrous.

Flowers: November–January.

Cape.—Stellenbosch district: Hottentots Holland near Somerset West, *Ecklon* and *Zeyher*; Cape district: Newlands, *Forbes* 89, Orange Kloof Farm, *Wolley Dod* 3166.

5. **P. Gueinzii** Harv.

Plant suffruticose. *Stems* 3–6 metres, diffuse, villose, becoming glabrescent. *Leaves* unifoliolate, 1–2·5 cm. long, up to 4 mm. broad, lanceolate, very acute, sub-sessile. *Stipules* ovate, acute, striate, persistent. *Flowers* axillary, pedicellate. *Pedicels* short, about 3 mm. long, bi-bracteolate. *Bracts* about 3 mm. long, ovate, acute, ciliate. *Calyx-tube* 2 mm. long 6 mm. in diameter, sparsely glandular and villous; lobes lanceolate, acute, ciliate, glands small, pilose on the inner surface; upper and lateral lobes 3–3·5 mm. long, about 1 mm. broad, lowest lobe 5 mm. long. *Vexillum* obovate, 1 cm. long, 8 mm. broad, with a narrow channelled claw 2 mm. long; alae 7 mm. long, 2 mm. broad, with a linear claw 2 mm. long; carina 5 mm. long, 3 mm. broad, with a linear claw 3 mm. long. *Ovary* glabrous; style 6 mm. long, glabrous.

Cape.—Stellenbosch district: Hottentots Holland, *Ecklon* and *Zeyher*.

6. **P. capitata** L.f.

Plant shrubby. *Stems* slender, up to 12 metres long, sparsely leafy, striate, glandular, glabrescent. Leaves uni or-trifoliolate; upper leaves usually unifoliolate; petioles variable, up to 2·5 cm. long; leaflets 1–8 cm. long, up to 4 mm. broad, linear to linear-lanceolate, acute, nigro-punctate, glabrescent. *Stipules* adnate to the base of the petiole, up to 7 mm. long, subulate, acute. *Inflorescence* spicate or compressed into an aggregated terminal head subtended by one or more unifoliolate leaflets with simple acute glandular pilose adnate stipules up to 1 cm. long, or stipules simple or connate. *Flowers* pedicellate. *Pedicels* about 2 mm. long, bracteate. *Calyx-tube* 1·5–2 mm. long, 3–5 mm. in diameter, glandular, glabrous to villoso-hirsute; lobes lanceolate, acute, ciliate, glandular, glabrous to villoso-hirsute without, pilose to nigro-hirsute within; upper and lateral lobes 1–3 mm. long, 0·5–1 mm. broad; lowest lobe 2·5–5 mm. long, 0·5–1 mm. broad. *Vexillum* 5–7·5 mm. long, 4–6 mm. broad, obovate, glandular, with a claw 0·5–2 mm. long; alae 4·5–7 mm. long, 1·5–2 mm. broad, with a linear claw 1–2 mm. long, carina 4–6 mm. long, 1·5–2 cm. broad, with a linear claw 1–3 mm. long. *Ovary* glabrous; style 3–7 mm. long, glabrous.

Flowers: November–April.

Cape.—Caledon district: Twenty-four Rivers, *Zeyher*; Tulbagh district: Waterfall, *Zeyher*; Cape district: Kenilworth, *Bolus* 3285; Knysna district: Knysna, *Zeyher*, Plettenberg Bay, *Leipoldt*; Uitenhage district: Witte Klip, *Bolus*, Zwartskops River, *Zeyher* 2386; Albany district: Grahamstown, *Glass*, *Southey*; Komgha district: Cape Morgan, *Flanagan* 2370.

Localities Unknown.—*Zeyher* 4945, *Tyson* 3049, *MacOwan* 2068.

7. **P. uncinata** E. and Z.

Plant small, 3–6 metres high; branching chiefly from the root. *Stems* erect, canescent, becoming glabrous, striate; glands becoming conspicuous when the stems are glabrous. *Leaves* trifoliolate, at equidistant nodes 3 cm. apart, shortly petiolate, stipulate; petioles up to 5 mm. long; leaflets up to 3·2 cm. long and 4 mm. broad, linear-oblong, a few lower ones cuneate-oblong, acuminate, uncinate, with scattered hairs and glands, the glands forming a continuous band round the margins. *Stipules* adnate to the base of the petiole, striate, canescent, glabrescent, with two lanceolate acute points up to 7 mm. *Inflorescence* terminal and axillary, in dense sub-globose heads. *Peduncles* very short, up to 6 mm. long. *Flowers* sessile or sub-sessile. *Calyx-tube* 3–4 mm. long, 6–8 mm. in diameter, canescent, distinctly 10-nerved, sparsely glandular; lobes linear-lanceolate, acute, glandular, canescent, ciliate, with the inner surface glabrous or shortly and thinly pilose; upper and lateral lobes 4–6 mm. long, 1–2·5 mm. broad; lowest lobe 6 mm. long, 2–3 mm. broad. *Vexillum* 6–8 mm. long, 4–6 broad, obovate with a linear claw 1–3 mm. long; alae 5–7 mm. long, 1–2 mm. broad, with a claw 3–4 mm. long; carina 3–4 mm. long, 1·5–2 mm. broad, with a claw 3–4 mm. long. *Ovary* pilose; style glabrous.

Flowers: November–January.

Cape.—Piquetberg district: Pentonville, *Edwards* 249; Tulbagh district: near Tulbagh, *Zeyher* 1554, *Rogers* 17341, Wintershoekberg, *Zeyher*; Cape district: Capetown, *Guthrie*; Caledon district: Vier-en-Twintig Rivier, *Zeyher*; Beaufort West district: Nieuwe Kloof, *Schlechter* 9038.

8. **P. oligophylla** E. and Z.

A tall slender virgate shrub. *Stems* glabrous, glandular, striate, sparsely leafy. *Leaves* uni- or trifoliolate, petiolate, stipulate; petioles up to 1 cm. long; leaflets up to 4·5 cm. and 4 mm. broad, linear to linear-lanceolate, acute, glabrous, glandular. *Stipules* minute, subulate. *Flowers* axillary 1–3 together. *Pedicels* up to 3 cm. long, bibracteolate near the apex. *Bracts* 2–4 mm. long, with acute glabrous ciliate glandular lobes. *Calyx-tube* 2–4 mm. long, 6–9 mm. in diameter, glandular, glabrous, 10-nerved; lobes 1–5 mm. long, 1–2 mm. broad, slightly unequal, lanceolate-ovate, acute, slightly sub-falcate, glabrous, glandular, ciliate, shortly pilose on the inner surface. *Vexillum* 6–11 mm. long, 7–12 mm. broad, sub-orbicular, geniculate; claw 1–4 mm. long, with two slight appendages at the apex; alae 0·6–1 cm. long, 2–5·5 mm. broad, with a linear claw 2–5 cm. long; carina 4–7·5 mm. long, 2·5–5·5 mm. broad, with a linear claw 3–6 mm. long. *Ovary* glabrous; style 3–8 mm. long, glabrous. *Pod*, when fully developed, about 6 mm. long and 3 mm. broad; seed about 4·5 mm. long, 2 mm. broad, brown.

A tall shrub 5–6 feet high, growing usually in moist places.

Flowers: Blue.

Cape.—Van Rhynsdorp district: Giftberg, *Phillips* 3236, 7488; Ceres district: Onderbokkeveld, *Ecklon* and *Zeyher*, Koude Bokkeveld, *Schlechter*, Matroosberg, *Phillips* 1944; Worcester district: Hex River Valley, *Tyson* 1908, *Rehmann* 1533, 1534; Riversdale district: Riversdale, *Muir* 81; George district: Outeniqua Mountains, *Hops* 52, George, *Schlechter* 2227; Humansdorp district: near Humansdorp, *Schonland* 3086, Witte Els Bosch, *Fourcade* 827; Port Elizabeth district: Hankey, *Sim* 173, *Forest Dept. Herb.* 3957; Bathurst district: Bathurst, *Rogers* 3516; Albany district: Grahamstown, Featherstone's Kloof, *Bolus* 1935, Atherstone, *Rogers* 3316, Howison's Poort, *Galpin* 141, *Glass*, *Barber*, *Galpin* 336, *Zeyher* 2383, *Ecklon* and *Zeyher*, *MacOwan* 448, Asylum, *Daly* and *Sole* 137, Hofman's Bosch, *Britten* 1327, near Sanatorium, Zuurberg, *Schonland* 3185, Cold Spring, *Rogers* 5635, 27312, 27514; Queenstown district: Queenstown, *Galpin* 8107, Cathcart Shiloh, *Baur* 862; Kingwilliamstown district: Kingwilliamstown, *Sim* 2301; Komgha district: Komgha, *Flanagan* 556, 3410; Tembuland, Xalanga, *Bolus* 8858.

Gt. Bushmanland, Vogelklip, *Pearson* and *Pillans* 5932, Leliefontein, *Pearson* 6344.

Localities Unknown.—*Rogers* 17584, *Schlechter* 10186, *Britten* 140.

9. **P. verucosa** Willd.

Plant shrubby. *Stems* erect, glandular striate, tomentulose. *Leaves* trifoliolate, petiolate, stipulate; petioles up to 1·5 cm. long; leaflets up to 4 cm. long and 4 mm. broad, linear-lanceolate, acute, glabrous, nigro-punctate. *Stipules* up to 3 mm. long, subulate, acute. *Flowers* axillary, 1–3 together. *Pedicels* up to 2·2 cm. long, bracteolate. Bracts about 1 mm. long. *Calyx-tube* 3 mm. long, 5–9 mm. in diameter, 10-nerved, glandular, glabrous; lobes ovate, acuminate, glabrous, glandular, ciliate, shortly pilose on the inner surface. *Vexillum* 0·5–1 cm. long, 0·5–1·2 cm. broad, sub-orbicular, geniculate; claw 0·5–2 mm. long, with two slight appendages at the apex; alae 5–9 mm. long, 2–5 mm. broad, with a linear claw 3–5 mm. long; carina 3–5 mm. long, 2-4 mm. broad, with a linear claw 1–6 mm. long. *Ovary* glabrous; style 2–8 mm. long, glabrous.

Cape.—Worcester district: Worcester, *Ecklon* and *Zeyher* 1520; Knysna district: Wittesdrift, Plettenberg Bay, *Zeyher*; Humansdorp district: Humansdorp, Storms River, *Schlechter* 5971; Uitenhage district: Zwartkops River, *MacOwan* 725, *Ecklon* and *Zeyher* 1521, *Zeyher* 2379; Port Elizabeth district: Walmer, *Paterson* 829, Braakens River, *Burchell* 4218.

10. **P. polyphylla** E. and Z.

Plant shrubby, pubescent, glabrous when older. *Stems* erect, leafy, branched. *Leaves* trifoliolate, sub-sessile, stipulate; leaflets 1·1–1·5 cm. long, 2–4 mm. broad, linear to linear-oblong, mucronate, glands immersed; lateral leaflets unequal sided. *Stipules* small, ovate, acuminate, not persistent. *Flowers* axillary, 2–3 together. *Pedicels* very short. *Calyx-tube* nigro-villous and veined; upper and lateral lobes subulate, the lowest ovate-lanceolate, longer than the rest.

Flowered: July.

Cape.—Uitenhage district: Krakakamma, *Ecklon* and *Zeyher* 1536. Description taken partly from "Flora Capensis," as there were no complete flowers on the material seen.

11. **P. Mundtiana** E. and Z.

Plant shrubby, up to ·6 m. high. *Stems* erect, pubescent, leafy. *Leaves* trifoliolate, petiolate, stipulate; petioles about 5 mm. long, glabrescent; leaflets 1·5–2·5 cm. long, 4–6 mm. broad, broadly linear to linear-oblong, tapering at the base, recurved mucronate, pellucid dotted. *Stipules* about 5 mm. long and 1·5 mm. broad, ovate, acute, pubescent, scarious, striate. *Flowers* axillary, 2–3 together. *Pedicels* short. *Calyx-tube* 3 mm. long, 8 mm. in diameter, glandular, villous; lobes lanceolate, acute, villous, glandular, ciliate, pilose on the inner surface; upper and lateral lobes 5–7 mm. long, 1–1·5 mm. broad; lowest lobe 8 mm. long, 2 mm. broad. *Vexillum* 6 mm. long, 5 mm. broad, obovate, with a narrow channelled claw 1·5 mm. long; alae 6 mm. long, 1·5 mm. broad, with a linear claw 2 mm. long; carina 3 mm. long, 2 mm. broad, with a linear claw 2 mm. long. *Ovary* and style missing in the specimen examined.

Flowered: December.

Cape.—Swellendam district: Swellendam, *Ecklon* and *Zeyher* 1537.

12. **P. candicans** E. and Z.

Plant shrubby, virgate, densely or thinly canescent, glabrescent. *Stems* erect, laxly leafy. *Leaves* trifoliolate, shortly petiolate, stipulate; petioles about 2 mm. long; leaflets 1·5 cm. long, 0·65 cm. broad, linear to linear-oblong, obtuse, recurved mucronate, nigro-punctate; a few of the lower leaflets cuneate. *Stipules* small, up to 3 mm. long, adnate to the base of the petiole, subulate, acute, glandular. *Inflorescence* axillary, 1–3 flowers on common peduncle. *Peduncles* up to 1·7 cm. long; pedicels about 4 mm. long. *Calyx-tube* 1·5–3 mm. long, 4–6 mm. in diameter, canescent, distinctly 10-nerved, with small often inconspicuous glands; lobes linear-lanceolate, acute, pilose, glandular, glabrous on the inner surface; upper and lateral lobes 2–4 mm. long, about 1 mm. broad, slightly sub-falcate; lowest lobe 4–6 mm. long, about 1 mm. broad. *Vexillum* 3–5 mm. long, 3–5 mm. broad, obovate, with a linear claw 1–2 mm. broad; alae 3–5 mm. long, 1–2 mm. broad, with a claw 1·5–2 mm. long; carina 2–3 mm. long, 1–2 mm. broad, with a claw 2 mm. long. *Ovary* pilose; style 2–3 mm. long, glabrous.

Flowered: September–May.

Cape.—Worcester district: Hex River, *Bolus* 8005; Caledon Division: *Zeyher*, Elandskop, *Schlechter* 9757, Ruggens near Zuurberg, *Galpin* 3960, near Genadendal, *Galpin* 3959, *Bolus* 7381; Swellendam district: Swellendam, Grootvaders Bosch, *Zeyher* 1539; Uitenhage district: Zwartkop River, *Zeyher* 2731; Albany district: Redhouse, Grahamstown, *Paterson* 238; Somerset East district: Bruntzeshoogte, *MacOwan*.

Without Locality: *Zeyher* 2373.

13. **P. axillaris** L.

Plant shrubby. *Stems* erect, glabrous, glandular, striate. *Leaves* trifoliolate, stipulate, petiolate; leaflets 1–2·8 cm. long, 3–8 mm. broad, linear to linear-oblong, tapering at the base, obtuse, mucronulate, nigro-punctate, glabrous. *Stipules* about 3 mm. long, subulate. *Flowers* axillary, usually solitary. *Pedicels* up to 2 cm. long, bracteolate near the apex. *Calyx-tube* 2–4 mm. long, 0·6–1 cm. in diameter, thickly nigro-punctate, glabrous: lobes 1–3 mm. long, 1–2 mm. broad, slightly unequal, ovate, obtuse, nigro-punctate, glabrous shortly ciliate, pilose on the inner surface. *Vexillum* 0·8–1 cm. long, 0·8–1·1 cm. broad, sub-orbicular, geniculate; claw channelled, 1·5–2 mm. long, with two slight appendages above; alae 0·7–1 cm. long, 3–5 mm. broad, with a claw 3–5 mm. long; carina 5–6 mm. long, 4–5 mm. broad, with a linear claw 5–6 mm. long. *Ovary* glabrous; style 6–9 mm. long, glabrous.

Cape.—Tulbagh district: Tulbagh, *Burchell* 1033; Knysna district: Knysna, *Duthie* 767, Plettenberg Bay, *Zeyher*; Uitenhage district: Witteklip, *MacOwan* 1044; Port Elizabeth district: Port Elizabeth, *Kemsley* 247, *Paterson* 829, Van Stadens River, *Bolus*.

14. **P. triantha** E. Mey.

A slender shrub up to 4 ft. *Stems* erect, tomentulose. *Leaves* trifoliolate, petiolate, stipulate; petioles about 6 mm. long; leaflets 0·5–2·5 cm. long, up to 6 mm. broad, linear, spathulate, recurved mucronate, thick, glabrous, nigro-punctate. *Stipules* about 2·5 mm. long, acuminate. *Flowers* axillary, crowded. *Pedicels* 0·5 1 cm. long. *Calyx-tube* 2 mm. long, 4–6 mm. in diameter, pubescent, grandular; lobes lanceolate, pubescent, pilose on the inner surface; upper and lateral lobes 1-2 mm. long, 0·5–1 mm. broad. *Vexillum* 4–8 mm. long, 4–6·5 mm. broad, obovate, with a linear claw 1·5–2 cm. long; alae 4–6 mm. long, 1·5–2·5 mm. broad, with a linear claw 2–3 mm. long; carina 2·5–3 mm. long, 1·5–2 mm. broad, with a linear claw 2·5–3 mm. long. *Ovary* glabrous or thinly pilose; style 3–4 mm. long, filiform.

Flowers: November–February.

Cape.—Clanwilliam district: Clanwilliam, *Leipoldt* 632; Tulbagh district: Witsenberg, *Zeyher* 446; Cape district: Blaauwberg, *Drege*; Paarl district French Hoek, *Schlechter* 10268, Paarl, *Schlechter* 202; Uitenhage district: Zwartkop River, *Zeyher* 263.

15. **P. Bolusii** Forbes n. sp.

Plant shrubby, small. *Stems* erect, leafy, glandular, striate; young stems densely albotomentose becoming glabrescent. *Leaves* trifoliolate, petiolate, stipulate; petioles about 7 mm. long; leaflets 1–2·5 cm. long, about 4 mm. broad, linear to linear-oblong, nigro-punctate, densely albo-hirsute becoming almost glabrous, recurved mucronate. *Stipules* adnate to the base of the petiole, up to 5 mm. long, subulate, acute. *Flowers* axillary, in groups of 3, sub-sessile. *Calyx-tube* 3 mm. long, 5 mm. in diameter, glandular, hirsute; lobes unequal, hirsute, long-ciliate, glandular, pilose on the inner surface; two upper lobes 2 mm. long, about 0·25 mm. broad, linear, acute; lateral lobes 3·5–4 mm. long, about 0·5 mm. broad, linear, acute; lowest lobe 6 mm. long, 1·5 mm. broad, lanceolate, acute. *Vexillum* 5·5 mm. long, 5·5 mm. broad, obovate, with a channelled claw 3 mm. long; alae 5·5 mm. long, 2·5 mm. broad, with a linear claw 2·5 mm. long; carina 3 mm. long, 1·5 mm. broad, with a linear claw 3 mm. long; *Ovary* thinly pilose; style 3 mm. long, filiform.

Flowered: October.

Cape.—Piquetberg district: Piquetberg, *Bolus*.

16. **P. oreophila** Schltr.

A very small slender herb, branching from the root. *Stems* decumbent, up to 3 metres long, filiform, subterete, with scattered leaves. *Leaves* trifoliolate, petiolate, stipulate; petioles slender; leaflets linear, acute, narrowing at the base. *Stipules* 4 5 mm. long, equalling or about half the length of the petiole, connate, linear-lanceolate, acute, glabrous.

Flowers axillary, solitary. *Pedicels* nearly equalling the leaves, bracteolate near the middle. *Bracts* up to 5 mm. long. *Calyx-tube* 2 mm. long, 4·5–5 mm. in diameter, glabrous, glandular; lobes linear-lanceolate, acute, glabrous, glandular, very shortly ciliate, glabrous on the inner surface; upper and lateral lobes 3–5 mm. long, 1–1·25 mm. broad; lowest lobe 5·5–6 mm. long, 1·5 mm. broad. *Vexillum* 5·5–6 mm. long, 6–8 mm. broad, sub-orbicular with a channelled claw 1·5–2 cm. long; alae 4·5–5 mm. long, 2 mm. broad, with a linear claw 2–2·5 mm. long; carina 3 mm. long, 2 mm. broad, with a linear claw 2–2·5 mm. long. *Ovary* glabrous; style 3·5 mm. long, glabrous.

Flowered: January. Flowers: Deep blue.

Cape.—Caledon district: Sir Lowry's Pass, *Schlechter* 7233.

17. **P. glaucina** Harv.

Plant suffruticose, diffuse. *Stems* slender, glabrous. *Leaves* trifoliolate, petiolate, stipulate; petioles 0·7–2 cm. long; leaflets 0·9–2 cm. long, up to 2 mm. broad, linear-lanceolate, acute, tapering at the base, glabrous, glandular. *Flowers* axillary, 1–3 together. *Pedicels* 1-1·5 cm. long, bracteolate near the middle. *Bracts* 2–2·5 mm. long, tri-lobed, ciliate, acute. *Calyx-tube* 2 mm. long, 5 mm. in diameter, glandular, glabrous, 10-nerved; lobes lanceolate, acute, glandular, glabrous, with almost reticulate veining, shortly ciliate, very shortly pilose on the inner surface; upper and lateral lobes 1·5–2 mm. long, up to 1 mm. broad; lowest lobe 3 mm. long, 1 mm. broad. *Vexillum* 4 mm. long, 4 mm. broad, obovate, with a channelled claw 1 mm. long; alae 3 mm. long, 1·5 mm. broad, with a linear claw 2 mm. long; carina 2 mm. long, 1 mm. broad, with a linear claw 3 mm. long. *Ovary* glabrous; style 3 mm. long, glabrous.

Cape.—Doornhoogte, *Ecklon* and *Zeyher*.

18. **P. tenuissima** E. Mey.

Plant slender, trailing. *Stems* up to 6 metres long, glabrous. *Leaves* trifoliolate, petiolate, stipulate; petioles up to 9 mm. long; leaflets up to 2·5 cm. long, 1·5 mm. broad, narrow, linear, acute, nigro-punctate, glabrous, sub-sessile. *Stipules* up to 2 mm. long, subulate, acute, glandular. *Flowers* axillary, solitary. *Pedicels* up to 3 cm. long, bracteolate, near the apex. *Calyx-tube* 2 mm. long, 5–6 mm. in diameter, glandular, glabrous; lobes acute, lanceolate, glabrous, ciliate, glandular, pilose on the inner surface; upper and lateral 2–3 mm. long, 1–1·3 mm. broad; lowest lobe 3–4 mm. long, up to 1–5 mm. broad. *Vexillum* 6–8 mm. long, 6–8 mm. broad, obovate, geniculate, with a channelled claw 1–2 mm. long; alae 6–8 mm. long, 2–3 mm. broad, with a linear claw 1·5–2 mm. long; carina 5 mm. long, 2 mm. broad, with a linear claw 2–3 mm. long. *Ovary* glabrous; style 9 mm. long, glabrous.

Cape.—Tulbagh district: Tulbagh, *Schlechter* 7476; Swellendam district: Wageboom's River, *Schlechter* 10701.

19. **P. odoratissima** Jacq.

Plant shrubby, at least 18 metres high. *Stems* striate, glandular, sparsely pilose. *Leaves* imparipinnate, petiolate, stipulate; petioles 5–8 mm. long; leaflets 5–7 pairs, 0·7–2·2 cm. long, about 1·5 mm. broad, linear-lanceolate, acute, glandular; young leaves laxly clothed with fairly long white hairs. *Stipules* about 4 mm. long and 2 mm. broad, lanceolate-ovate, acute, ciliate. *Flowers* axillary, 1–3 or more together. *Pedicels* up to 1·5 cm. long. *Calyx-tube* 3–5 mm. long, 7–5 mm. in diameter, sparsely pilose with long white hairs, glandular; lobes, lanceolate, acute, slightly sub-falcate, ciliate, shortly pilose on the inner surface; upper and lateral lobes 4 mm. long, 2 mm. broad; lowest lobe 1 cm. long, 2·5 mm. broad. *Vexillum* 1 cm. long, 1·1 cm. broad, sub-orbicular, geniculate, with a channelled claw 3 mm. long; alae 1 cm. long, 5 mm. broad, with a linear claw 5 mm. long; carina 6 mm. long, 4 mm. broad, with a linear claw 5·5 mm. long. *Ovary* glabrous; style 6 mm. long, glabrous.

Flowers: Pure white, very fragrant.

Flowered at Kirstenbosch, October–November, 1923, 1924. Original locality unknown.

20. **P. pinnata** Linn.

Plant a tall much branched woody shrub up to 30 metres high. *Stems* striate, virgate, glandular, glabrous or pubescent. *Leaves* impar-pinnate, petiolate, stipulate; leaflets up to 5 cm. long and 3 mm. broad, linear to linear-lanceolate, acute, glandular, sometimes recurved at the apex. *Stipules* free, about 5 mm. long, lanceolate to ovate-lanceolate, acute, pubescent. *Flowers* axillary, 1–3 or several together. *Pedicels* sub-sessile or up to 2·5 cm. long, bracteolate near the apex. *Bracts* 1–3 mm. long, connate, pilose, with acute ciliate lobes. *Calyx-tube* 2–6 mm. long, 0·4–1·3 cm. in diameter, villous or glabrous, glandular; lobes lanceolate, ovate, acute, glabrous or villous, glandular, ciliate, pilose on the inner surface; upper and lateral lobes 2–7 mm. long, 0·5–3 mm. broad; lowest lobe 0·4–1 cm. long, 2–4 mm. broad. *Vexillum* 0·4–1·4 cm. long, 0·4–1·5 cm. broad, sub-orbicular or broadly obovate, geniculate; claw channelled 1–4 mm. long, with or without the two small appendages at the apex of the claw; alae 0·4–1·2 cm. long, 1·5–6 mm. broad, with a linear claw 1–5 mm. long; carina 2·5–8 mm. long, 1·5–7 mm. broad, with a linear claw 2–7 mm. long. *Ovary* glabrous; style 0·3–1 cm. long. *Seed* 4 mm. long, 2 mm. broad, reddishbrown.

Flowers: Pale to deep blue. This species has a wider distribution than any other native species and is in bloom almost the whole year.

Cape.—Clanwilliam district: Clanwilliam, *Rogers* 16798, Olifants River, *Leipoldt*; Tulbagh district: *Scott* and *Elliot*, Winterhoek, *Phillips* 1729; Cape district: Devils Peak, *Ecklon* and *Zeyher* 1519, Table Mountain, *Forbes* 139, Newlands, *Forbes* 91, Wynberg Mountain, *Wolley Dod* 22; Stellenbosch district: Stellenbosch, *Ecklon* and *Zeyher* 1515; Paarl district: French Hoek, *Schlechter* 9263, 10268, *Phillips* 1089; Caledon district: Caledon *Zeyher*, *Bolus*; Swellendam district: Swellendam, *Ecklon* and *Zeyher* 1518; Riversdale district: Riversdale, *Muir* 79, Aasvogelberg, *Muir* 1850, Ladismith, Seven Weeks Poort, *Phillips* 1432; Mossel Bay district: Mossel Bay, *Rogers* 4165, *Potts*; George district *Mitchell* (*Bolus Herb.* 16090), *Rogers* 4281, near Langekloof, *Zeyher* 1517, Robertson Pass, Outeniqua Mountains, *Hops* 53, Garcia's Pass, *Phillips*; Knysna district: Knysna, Main Forest, *Schonland* 3600, Plettenberg Bay, *Smart* (*Rogers* 15457); Kingwilliamstown district: Zitzikamma Mountains, *Britten* 1079; Humansdorp district: Humansdorp, *Schonland* 3018, Witte Els Bosch, *Fourcade* 892, 923, 924, *Muir* 1250, Assegai Bosch, *Rogers* 2834, Slang River, *Phillips* 3441; Uitenhage district: Uitenhage, *Ecklon* and *Zeyher* 305, *Schonland* 3730, *Britten* 3027, Van Staadens, *Paterson* 734; Albany district: Grahamstown, *Zeyher* 903, 2380, *Rogers*, *Schonland*, Signal Hill, *Dale* and *Cherry* 883, Coldspring, *Gower*; Queenstown district: Katberg, *Schonland* 4298; Fort Beaufort district: Hogsback, *Rattray* 83, *Stayner* 11, Hoffman's Bosch, *Britten* 1185, near Kat River, *Ecklon* and *Zeyher* 1514; Cathcart district: Cathcart, *Cotterrell* 164, *Galpin* 7360; Komgha district: near Kei Mouth, *Flanagan* 178; Kentani district: Kentani, *Pegler* 255; Umtata district: Umtata, *Schlechter* 6337; Beaufort West district: Murraysburg, *Bolus* 220.

Transvaal.—Lydenburg district: Pilgrims Rest, *Rogers* 23110, Lydenburg, *Wilmer*; Zoutpansberg district: Zoutpansberg, Rietfontein, *Leendertz* 808; Woodbush, *Jenkins* 7194; Barberton district: Barberton, *Galpin* 401, Elandshoek, *Rogers* 448.

Swaziland.—*Stewart* 3687.

Natal.—Drakensberg, Polela, *Evans* 714; Karkloof, *Dimmock-Brown* 333; Maritzburg, *Moss* 3344; Richmond, *Wood* 84, 9852; Estcourt, *Wood* 10261, *Wylie* (*Wood* 10006); Field's Hill, *Wood* 12830; *Evans* 146; Illovo, *Wood* 6411.

Zululand.—Inyiza, *Edwards* 315; Ngoya, *Wood* 9314; Nkandhla, *Wylie* (*Wood* 8817).

21. **P. affinis** E. and Z.

A tall virgate shrub up to 18 metres. *Stems* woody, striate, glandular, slightly pilose when young. *Leaves* imparipinnate with 2-4 pairs of leaflets, stipulate, petiolate; petioles 0·7–2·3 cm. long; leaflets up to 5 cm. long, 6 mm. broad, linear-lanceolate to ovate-lanceolate, obtuse, glandular, mucronulate. *Stipules* small, deltoid. *Flowers* axillary, 1–3 or

more together. *Pedicels* up to 4·5 cm. long, bracteolate near the apex. *Bracts* bi-lobed, up to 5 mm. long, pilose, glandular, veined. *Calyx-tube* 4 mm. long, 1 cm. in diameter, thickly nigro-punctate, sparsely to densely nigro-hirsute, veined; lobes lanceolate-ovate to ovate, acute, hirsute, nigro-punctate, hirsute on the inner surface; upper and lateral lobes 3·5–4 mm. long, 2 mm. broad; lowest lobe 5 mm. long, 3–4 mm. broad. *Vexillum* 0·9–1·2 cm. long, 1·2–1·7 cm. broad, obovate, geniculate, with a linear claw 3–4 mm. long; alae 0·8 1·1 cm. long, 5 mm. broad, with a linear claw 5–6 mm. long; carina 6–7·5 mm. long, 4–4·5 mm. broad, with a linear claw 6–8 mm. long. *Style* 0·8–1 cm. long.

Flowers: Deep blue or purple.

Cape.—Riversdale district: Riversdale, near Albertinia, *Muir* 1851; George district: George, *Rogers* 4291; Port Elizabeth district: Port Elizabeth, Van Staadensberg, *Zeyher* 2378; Albany district: Grahamstown, *Rogers* 27423; Stutterheim district: Stutterheim, *Ecklon* and *Zeyher*, Rooi Vaal, *Flanagan* 178.

Transvaal.—Barberton district: Barberton, *Pole Evans*, *Rogers* 14015; Middelburg district: Waterval Boven, *Rogers* 2743; Lydenburg district: Lydenburg, *Rogers* 14564, 23110.

Swaziland.—Mbabane, *Rogers* 11457.

Basutoland.—MacaMac, Drakensberg, *MacLea* 3017.

Localities Unknown.—*Burchell* 6038, *Rogers* 17382.

22. **P. repens** L.

Plant suffruticose. *Stems* procumbent or prostrate, sparsely pilose, glandular. *Leaves* trifoliolate, petiolate, stipulate; petioles up to 3 cm. long, glandular, sparsely pilose; young petioles more thickly pilose: leaflets thick, 0·5–1·5 cm. long, 2–6 mm. broad, obovate to obovate-oblong, cuneate, retuse or obtuse, nigro-punctate, sparsely pilose. *Stipules* up to 2 mm. long, ovate, acute. *Flowers* axillary, 1 or more together. *Pedicels* equalling the leaves, glandular, pilose, bracteolate near the middle. *Bracts* about 2·5 mm. long, bi-lobed, ovate, acuminate, pilose, glandular. *Calyx-tube* 2–4 mm. long, 5–7 mm. in diameter, glabrous or laxly hairy, thickly nigro-punctate; lobes ovate, obtuse, glabrous or villous, ciliate, nigro-punctate, shortly pilose on the inner surface: upper and lateral lobes 1·5–3 mm. long 1–2·5 mm. broad, lowest lobe 1·3 4 mm. long, 1 2·5 mm. broad. *Vexillum* 6–8 mm. long, 6·5–9 mm. broad, obovate, glandular, with a narrow claw 1·2 mm. long; carina 5–6 mm. long, 2–3 mm. broad, with a linear claw 3–4 mm. long; alae 6–7·5 mm. long, 1·5–3 mm. broad, with a linear claw 2–3 mm. long. *Ovary* glabrous, sometimes glandular; style 5–7 mm. long, filiform.

Flowers: October–April.

Cape. Cape district: Near Retreat, *Bolus* 3076, Kalk Bay, *Bolus* 3076, *Moss* 3340, *Wolley Dod* 2216, Wynberg, and Tigerberg, *Zeyher* 1525, Kuils River, *Zeyher* 2384; Humansdorp district: Humansdorp, Slang River, *Phillips*; Port Elizabeth district: Port Elizabeth, *Kemsley* 221, *Potts* 303, *Christie* 56, Redhouse, *Paterson* 587; Uitenhage district: Zwartkops River, *Zeyher* 2377, Algoa Bay, *Zeyher* 1526, *Zeyher* 668, New Brighton, *Southey*.

23. **P. bracteata** Linn.

A low suffruticose. *Stems* diffuse or erect, virgate, leafly, pubescent when young, becoming glabrous. *Leaves* trifoliolate, shortly petiolate, stipulate; petioles up to 3 mm long: leaflets up to 2·6 cm. long and 1·5 cm. broad, broadly obovate or cordate, glabrescent, pellucid-dotted, recurved mucronate. *Stipules* adnate to the base of the petiole, up to 8 mm. long, lanceolate, ovate, acute, striate. *Inflorescence* terminal, spicate, having the appearance of a capitulum, sessile. *Flowers* subtended by bracts variable in size and shape. *Calyx-tube* 2·5–5 mm. long, 4·5–8 mm. in diameter, laxly hirsute or villous, pellucid-dotted,

distinctly 10-nerved ; lobes pellucid-dotted, long ciliate, laxly hirsute or villous, glabrous or sparsely pilose on the inner surface ; upper and lateral lobes 1·5–8 mm. long, 0·5–1·5 mm. broad, lanceolate, acute, slightly sub-falcate ; lowest lobe 0·4–1 cm. long, 1·5–5 mm. broad, broadly ovate, cuspidate, reticulately veined. *Vexillum* 0·4–1·1 cm. long, 4–7 mm broad, obovate-oblong or sub-orbicular, slightly geniculate with a channelled claw 1·5–3·5 mm. long ; alae 0·4–1 cm, long, 1–3 mm. broad, with a linear claw 2·5–4 mm. long ; carina 2·5–4·5 mm. long, 1–2 mm. broad, with a linear claw 3–5 mm. long. *Ovary* glabrous or slightly pilose ; style 3–5 mm. long, glabrous. *Pod* turgid 5·5 mm. 3 mm. broad, glabrous ; seed small, purplish-brown.

Flowered : June–January. Flowers : White to blue.

Cape.—Paarl district : Wellington, *Tyson* 917, Du Toit's Kloof, *Bolus* 5158 ; Cape district : Capetown, *Paterson* 50, *Rogers* 27003, Green Point, *Zeyher*, Table Mountain, *Rogers* 17809, *Bolus* 1085, Newlands, *Forbes* 90, Rondebosch and Wynberg, *Ecklon* and *Zeyher* 1543, Wynberg, *Wolley Dod* 19, Muizenberg, *Pillans* 3427, Fish Hoek, *Wolley Dod* 712, *Rogers* 16087, Cape Point, *Forbes* 182, Hout Bay, *Galpin* 3967, Lakeside, *Moss* and *Rogers* 1633 ; Caledon district : Houw Hoek, *Schlechter* 9435 ; George district : George, *Schlechter* 2349, 5863, Georgetown, *Hops* ; Knysna district : Knysna, *Keet* 247, between Knysna and Grahamstown, *Bolus* 1085 ; Humansdorp district : Humansdorp, Witte Els Bosch, *Fourcade* 937, near Zitzikamma, *Forest Dept.* 71 ; Uitenhage district : Uitenhage, *Zeyher* 393, Zwartkops River, *Ecklon* and *Zeyher* 1544, 1549, *Zeyher* 2372 ; Port Elizabeth district : Port Elizabeth, *Kemsley* 131, *West* 245, Staadens Mountains, *Zeyher*, Van Staadens River, *Zeyher* 2376 ; Albany district : Grahamstown, *MacOwan* 314 ; Kingwilliamstown district : Kingwilliamstown, *Tyson*, Rattel River, *Schlechter* 9723 ; De Aar district : Philipstown, *Ecklon* and *Zeyher* 1548.

24. **P. Bowieana** Harv.

Plant suffruticose. *Stems* slender, 6 or more metres long, diffuse, branching, puberulous, *Leaves* trifoliolate, shortly petiolate, stipulate ; petioles 2 mm. long, leaflets 2–2·5 cm. long, 6–7·5 mm. broad, cuneate-obovate, recurved-mucronate, pellucid-dotted, ciliate, laxly hispid when young, becoming glabrous. *Peduncles* axillary, longer than the leaves, racemose. *Pedicels* 2–3 together, equalling the calyx. *Bracts* lanceolate. *Calyx-tube* pale, sub-glabrous ; lobes narrow-lanceolate ; lowest lobe longest ; calyx segments each marked with three purple striae.

Cape.—Cape, *Bowie*.

Description taken from " Flora Capensis." No specimen seen.

25. **P. decumbens** Ait.

Plants suffruticose or decumbent. *Stems* slender, striate, decumbent, young parts densely clothed with cano- or rufo-pubescence, becoming glabrous. *Leaves* trifoliolate, stipulate, petiolate : petioles up to 5 mm. long ; leaflets 0·8–1·6 cm. long, 4–6 mm. broad, cuneate or cordate, recurved-mucronate, nigro-punctate, pubescent. *Stipules* up to 6 mm. long, adnate to the base of the petiole, hyaline, ovate, very acute. *Flowers* axillary, 1–3 together, often crowded at the ends of the branches. *Pedicels* up to 2 mm. long. *Calyx-tube* 2–3 mm. long, 3·5–5 mm. in diameter, villous or sparsely hirsute ; lobes lanceolate, acute, long ciliate, villous or sparsely hirsute, shortly pilose on the inner surface ; upper and lateral lobes 1–4 mm. long, 0·5–1 mm. broad ; lowest lobe 3–6·5 mm. long, 1–2 mm. broad ; glands present on tube and lobes, especially on the lowest lobe. *Vexillum* 4·5–7 mm. long, 4–6 mm. broad, obovate, with a channelled claw 1·5–3 mm. long ; alae 4·5–7 mm. long, 1·5–2·5 mm. broad, with a linear claw 2–3 mm. long ; carina 2·5–4 mm. long, 1–1·5 mm. broad, with a linear claw 2·5–3 mm. long. *Ovary* glabrous ; style 3–4 mm. long, glabrous.

Cape.—Piquetberg district: Piquetberg, *Bolus*: Malmesbury district: Moorreesburg, *Bolus* 9957; Tulbagh district: Tulbagh, *Rogers* 17436, *Zeyher*; Ceres district: Mitchell's Pass, *Schlechter* 9971; Cape district: Table Mountain, *Bolus* 2770, 2771, 4272, *Ecklon* and *Zeyher* 1538, *MacOwan* 73, *Moss* 2610, Rosebank, *Pillans* 3474, Rondebosch, *Hutton*, *Forbes* 179, Rondebosch and Newlands, *Wolley Dod* 1901, Kirstenbosch, *Verdoorn*, *Forbes* 87; Stellenbosch district: Somerset Strand, *Rogers* 17674; Paarl district: French Hoek, *Phillips* 1090; Caledon district: Sir Lowry's Pass, *Galpin* 369, Houw Hoek, *Schlechter* 5440; Riversdale district: Riversdale, *Muir* 5085; Swellendam district: Swellendam, *Kennedy*; Robertson district: Barrydale, *Galpin* 3963; Humansdorp district: Humansdorp, *Bolus* 2294; Uitenhage district: Zwartkop River, *Ecklon* and *Zeyher* 1033, *Zeyher* 445; Port Elizabeth district: Redhouse, *Paterson* 206, Humewood, *Paterson* 2613, *West* 246; Albany district: Grahamstown, *MacOwan* 818, 1083, *Rogers* 1567, Signal Hill, *Dale* and *Cherry* 1025, *Balcock*, Kaffraria, Mount Coke, *Sim* 1507, Bethelsdorp, *Zeyher*.

26. **P. argentea** Thunb.

Plant a slender shrub. *Stems* diffuse or sub-erect, leafy, clothed with adpressed whitish pubescence. *Leaves* trifoliolate, petiolate, stipulate; petioles 2–4 mm. long; leaflets 6–8 mm. long, 4–5 mm. broad, obovate, recurved-mucronate, minutely pellucid-dotted, thinly canescent on both surfaces. *Flowers* in threes, axillary or in an interrupted terminal pedunculate raceme. *Bracts* minute. *Calyx-tube* silky canescent; lobes lanceolate, two uppermost semi-connate.

Description from "Flora Capensis." No specimen seen.

27. **P. biflora** Harv.

Plant low-growing, forming a thick carpet, much branched, pubescent when young, becoming glabrous. *Leaves* trifoliolate, petiolate, stipulate; petioles up to 4 mm. long; leaflets thickish 2–3 mm. long, 2–2·5 mm. broad, obovate, nigro-punctate, pubescent when young, glabrous or with a few scattered hairs when older, with distinct veining on the lower surface. *Stipules* minute, ovate, withering. *Flowers* axillary; two sessile flowers on peduncle. *Peduncle* bracteolate at apex. *Bracts* very small. *Calyx-tube* 3 mm. long, 4·5 mm. in diameter, hispid, glandular, distinctly 10-nerved; lobes oblong, obtuse, hispid, ciliate, glandular, pilose on the inner surface; upper and lateral lobes 1·5–2 mm. long, 0·5 mm. broad; lowest lobe broadest, 2 mm. long, 1 mm. broad. *Vexillum* 3·5 mm. long, 4 mm. broad, obovate, geniculate, claw 1 mm. long, with a slight appendage at the apex; alae 3·5 mm. long, 2 mm. broad, with a linear claw 2·5 mm. long; carina 2 mm. long, 1·5 mm. broad, with a linear claw 2·5 mm. long. *Ovary* pilose; style 1·5 mm. long, glabrous or very sparsely pilose.

Flowers: Blue with a white vexillum.

South West Africa.—Keetmanshoop to Windhoek, *Pearson*, in *Percy Sladen Memorial Expedition*.

28. **P. obtusifolia** D.C.

A small diffuse plant. *Stems* up to 9 metres, slender, spreading, villoso-canescent, becoming glabrous when older; very pale. *Leaves* trifoliolate, petiolate stipulate; petioles usually fairly long, 0·5–7 cm. long; leaflets 0·3–2·1 cm. long, 0·2–1·5 cm. broad, obovate or elliptic obtuse, thinly canescent, glandular, plicate, with margins slightly dentate. *Stipules* up to 3 mm. long, ovate, acute, ciliate, canescent. *Inflorescence* axillary, spicate. *Peduncles* with 3–8 flowers. *Flowers* sub-sessile. *Calyx-tube* 1·5–4 mm. long, 3–5 mm. in diameter, densely albo-villous; lobes lanceolate-ovate, ciliate, villous, pilose on the inner surface: upper and lateral lobes 1–2 mm. long, 0·5–1 mm. broad; lowest lobe 2–4·5 mm. long, 1–1·5 mm. broad. *Vexillum* 3–5 mm. long, 3–4 mm. broad, obovate, with a channelled claw 1–1·5 mm. long; alae 3–4·5 mm. long, 1–2 mm. broad, with a linear claw 1·5–4 mm. long; carina 2–3 mm. long, 1–1·5 mm. broad, with a linear claw 2–2·5 mm. broad. *Ovary* villous; style 1–3 mm. long, glabrous or sparsely pilose.

Cape.—Cape district: Newlands, *Wilman*; Swellendam district: Gauritz River, *Zeyher* 450; Calvinia district: Near Twee River, *Burtt-Davy* 17562; Graaff-Reinet district: Graaff-Reinet, *Bolus* 127; Beaufort West district: Murraysburg, *Bolus* 35; Kimberley district: Barkly West, *W.G.B.* 637, *Bolus* 6814, near Vaal River, *Bolus* 6803; Vryburg district: Vryburg, *Sharpe*; Kuruman district: Kuruman, *Burtt-Davy*, Langberg, *Lanham* 4032.

South West Africa.—Great Namaqualand, Ramansdrift, *Schlechter* 11459; Holoog, *Pearson* 9808; Kiubis, *Pearson* 8012, 8026; Tsubgaus, *Pearson* 9204; Great Fish River, *Pearson* 9210, 9805, 9274; Tsondat, *Pearson* 9189; Kalahari, *Ireland* 16134; Krai Kluft Ravine, *Pearson* 8280; Walvis Bay, *Marloth* 1481.

Namaqualand Minor.—Near Henkies, *Phillips* 1587.

Transvaal.—Pretoria district: Pienaar's River, *Schlechter* 4211; Bloemhof district: Christiana, *Burtt-Davy*; Zeerust district: Zeerust, *Potts* 4257, *Burtt-Davy*.

Orange Free State.—Boshof District: *Burtt-Davy*; Bloemfontein district: Bloemfontein, *Burtt-Davy*; Heilbron district, Heilbron, *Flanagan* 1459.

Locality Unknown.—*Dinter* 125.

29. **P. rotundifolia** Linn.

A suffruticose about 3 metres high. *Stems* ascending, leafy, densely hispid, becoming glabrous when older. *Leaves* unifoliolate, petiolate, stipulate, 0·9–2·7 cm. broad, 0·9–4 cm. long, ovate to ovate-elliptic, obtuse or acute, mucronulate, sparsely glandular, with reticulate veining, glabrous; petioles up to 5 mm. long. *Stipules* adnate to the base of the petiole, equalling or exceeding the petiole, lanceolate, subulate veined, glabrous, glandular. *Inflorescence* spicate, many-flowered. *Peduncles* terminal and axillary, 4–6 mm. long, hairy. *Flowers* on short pedicels, subtended by a small bract. *Calyx-tube* 3 mm. long, 7 mm. in diameter, densely hirsute with long white hairs, glands translucent; lobes lanceolate-ovate, long hirsute, ciliate, thinly pilose on the inner surface; upper and lateral lobes 6–7 mm. long, up to 2 mm. broad; lowest lobe 1·1 cm. long, 3 mm. broad. *Vexillum* about 1 cm. long and 5 mm. broad, obovate, with a channelled claw 2 mm. long; alae 8 mm. long, 2·5 mm. broad, with a linear claw 3·5 mm. long; carina 5·5 mm. long, 2·5 mm. broad, with a linear claw 4 mm. long. *Ovary* hispid; style 4 mm. long. *Pod* membraneous, about 6 mm. long and 5 mm. broad, hispid.

Flowers: July–April.

Cape.—Caledon district: Houw Hoek, *Bolus* 80, near Klein River; Clanwilliam district: Vogelgat, *Schlechter* 9503, 10417.

30. **P. Thomii** Harv.

A small suffruticose. *Stems* slender, ascending, hairy. *Leaves* unifoliolate, petiolate, stipulate, 1–4 cm. long, 0·5–2·15 cm. broad, elliptic-lanceolate to elliptic-ovate or oblong, mucronulate, with reticulate veining, no glands present, densely hairy when young and never becoming quite glabrous; petioles up to 5 mm. long. *Stipules* about 7 mm. long and 2 mm. broad, ovate, acute, nerved, hispid. *Inflorescence* spicate. *Peduncles* terminal and axillary, bracteate, hairy, exceeding the leaves. *Flowers* sessile or sub-sessile. *Calyx-tube* 3–3·5 mm. long, 7 mm. in diameter, veined, thickly hirsute; lobes linear-lanceolate to ovate-lanceolate, acute, hirsute, glabrous on the inner surface; upper and lateral lobes 5 9 mm. long, 1·5–2 mm. broad; lowest lobe 0·8–1 cm. long, 2·5–3 mm. broad. *Vexillum* 1·15–1·4 cm. long, 8–9 mm. broad, obovate with a linear claw 1·5 mm. long; alae 0·9 1 cm. long, 3 mm. broad, with a linear claw 4 mm. long; carina 5–6 mm. long, 2·5–3 mm. broad, with a linear claw 4·5–5 mm. long. *Ovary* pilose; style 4–5 mm. long, pilose.

Flowers: July–October.

Cape.—Caledon district: Hermanus, *Bolus* 6378, Pieter's Fontein, *Bodkin* (*Bolus* 6378).

31. **P. aculeata** L.

An erect virgate shrub up to 12 metres. *Stems* woody, branched, leafy, glabrous, glandular, spiny with persistent stipules. *Leaves* trifoliolate, petiolate, stipulate ; petioles 1·5–4 mm. long, glandular, glabrous ; leaflets thickish, 1·5–8 mm. long, up to 2 mm. broad, cuneate, nigro-punctate on both surfaces, with a sharply curved mucro. *Stipules* adnate to the base of the petiole, 2–3 mm. long, persistent, subulate. *Flowers* axillary, solitary or 1–3 together. *Pedicels* up to 1·3 cm. long, bracteolate near the apex, often crowded on the upper parts of the stem. *Bracts* about 5 mm. long, connate, ovate, acuminate, nigro-punctate. *Calyx-tube* 3 5·5 mm. long, 0·8–1·1 cm. in diameter, glabrous, thickly glandular, nerved : lobes ovate, acuminate, glabrous, glandular, pilose on the inner surface, upper and lateral lobes 2·5 6 mm. long, 1·5–3·5 mm. broad ; lowest lobe 0·3–1 cm. long, 2–5·5 mm. broad. *Vexillum* 0·8–1·3 cm. long, 0·8–1·5 cm. broad, obovate, geniculate, with a channelled claw 1 3 mm. long : alae 0·7 1 cm. long, 3·5–6 mm. broad, with a linear claw 2·5–5 mm. long ; carina 4–8 mm. long, 3–5 mm. broad, with a linear claw 3·5 mm. long. *Ovary* 1–2 mm. long, glabrous ; style 4·5–8 mm. long, glabrous.

Flowers : August–November.

Cape.—Cape district : Table Mountain, *Ecklon* and *Zeyher* 1545, *MacOwan*, *Galpin* 3966, *Bolus* 4660, *Rogers* 17744, Orange Kloof, *Wolley Dod* 20 ; Stellenbosch, Hottentots Holland Mountains, near Gordon's Bay, *Bolus* 9865, 9933 ; Clanwilliam district : near Vogelgat, *Schlechter* 9516.

32. **P. Keetii** Schonl.

A shrub. *Stems* erect, glabrous, glandular. *Leaves* trifoliolate, petiolate, stipulate ; petioles up to 1 cm. long : leaflets 0·5 2·5 mm. long, 0·4–1·1 cm. broad, obovate, thickly nigro-punctate, glabrous, mucronulate ; terminal leaflet on short petiole : lateral leaflets sub-sessile. *Stipules* not exceeding 5 mm. long, ovate, lanceolate, acute. *Flowers* axillary, solitary. *Pedicels* up 3·5 cm. long, bracteolate at the apex. *Bracts* tri-lobed, 2 3 mm. long, ovate, acuminate, glandular, glabrous. *Calyx-tube* 3 mm. long, 8 mm. in diameter, glabrous, thickly glandular ; lobes ovate, acute, glandular, glabrous, ciliate, pilose on the inner surface : upper and lateral lobes 2–4 mm. long, 1 5 mm. broad ; lowest lobe slightly longer. *Vexillum* 8 mm. long, 1 cm. broad, obovate ; claw channelled, 3 mm. long, with two slight appendages at the apex ; alae 8 mm. long, 4 mm. broad, with a linear claw 4 mm. long : carina 6 mm. long, 4 mm. broad, with a linear claw 6 mm. long. *Ovary* glabrous ; style 7 mm. long, glabrous.

Flowered : January. Flowers : Colour, light blue.

Cape.—Knysna district : Hoogeberg, *Keet* 1055 (Type).

33. **P. polysticta** Benth.

A shrub, up to 10·5 metres. *Stems* woody, erect, striate, hairy, becoming almost glabrous when older, glandular. *Leaves* trifoliolate, sub-sessile or very shortly petioled, stipulate ; petioles about 3 mm. long ; leaflets 0·9–3·6 cm. long, 0·3–1·5 cm. broad, oblong, cuneate, nigro-punctate, recurved-mucronate, glabrescent. *Stipules* small, deltoid. *Flowers* axillary in clusters. *Peduncles* 2–4 mm. long with 3 or more short pedicels to each peduncle. *Calyx-tube* 2–3·5 mm. long, 5–7 mm. in diameter, veined, tomentulose, glandular ; lobes lanceolate, acute, tomentulose, glandular, pilose on the inner surface ; upper and lateral lobes 1–3·5 mm. long, about 1 mm. broad ; lowest lobe 4–5 mm. long, 1–1·5 mm. broad. *Vexillum* 6–8 mm. long, 5–6 mm. broad, obovate, with a short claw 0·5–2 mm. long : alae 5–7 mm. long, 1·5–2 mm. broad, with a linear claw 2·5–3 mm. long ; carina 3–4 mm. long, 1·5–2 mm. broad, with a linear claw 3–4 mm. long. *Ovary* glabrous ; style 3·5 mm. long.

Flowers : August–April.

The following note is attached to Mrs. Dieterlen's specimen No. 372 in the S.A. Museum :—

" Sesuto—Mohlonecha.—He who makes respectable. A chief who wishes to have prestige in the sight of his subjects must bathe the whole of his body with a decoction of this plant. The burnt root is smoked as a cure for cold in the head."

Cape.—Uitenhage district: Uitenhage, *Drege*; Oudtshoorn district: Oudtshoorn, *Taylor* 323; Albany district: Zuurberg, *Paterson* 44, Griqualand East, Mount Currie, *Tyson* 1319, Dornkop, *Zeyher*, *Tyson* 519.

Transvaal.—Pietersburg district: Pietersburg, *Moss* and *Rogers* 1330: Messina district: Louis Trichardt, *Rogers* 21148; Heidelberg district: Heidelberg, *Burtt-Davy* 15435.

Swaziland.—Hlatikulu, *Stewart* 181.

Orange Free State.—*Cooper* 1114.

Basutoland.—Leribe, *Dieterlen* 372.

Natal.—Ladysmith, *Wood* 8010; Estcourt, *Wood* 9953; Weenen County: Blaaukrans, *Wood* 3517; Boston, *Wood* 9900.

No Locality.—*Gerrard* and *McKen* 440.

34. **P. carnea** E. Mey.

A shrub 12–15 metres high. *Stems* leafy, reddish pubescent, at length becoming glabrous. *Leaves* trifoliolate, stipulate, sub-sessile; leaflets up to 1·5 cm. long and 7 mm. broad, oblong to cuneate-oblong, obtuse, pellucid-dotted, recurved mucronate, glabrous. *Stipules* about 2 mm. long, deltoid. *Flowers* axillary, 2–3 together. *Pedicels* very short. *Calyx-tube* 2–3·5 mm., 5–6 mm. in diameter, veined, hirsute, glandular: lobes linear-lanceolate, lanceolate or ovate, acute, glandular, ciliate, hirsute, glabrous on the inner surface; upper and lateral lobes 2–3·5 mm. long, 0·5–1 mm. broad; lowest lobe 3–5 mm. long, 1–1·5 mm. broad. *Vexillum* 6–7 mm. long, 5–6 mm. broad, obovate, with a channelled claw 1–2 mm. long; alae 5·5–7 mm. long, 2–2·5 mm. broad, with a liner claw 2·5=3 mm. long; carina 3–4 mm. long, 1·5–2 mm. broad, with a linear claw 3–4 mm. long. *Ovary* glabrous or very slightly pilose; style 2–4 mm. long, glabrous.

Flowers: August–March.

Cape.—Riversdale district: Riversdale, *Muir* 484, Langebergen, *Schlechter* 5691; Oudtshoorn district: Oudtshoorn, *Britten* 80; Knysna district: Knysna, *Keet* 278, 2716, *Fourcade* 1519, Plettenberg Bay, *Rogers* 15513, Clarkson, *Galpin* 3961, *Schlechter* 6012; Humansdorp district: Humansdorp, *Fourcade* 2330, Assegai Bosch, *Fourcade* 857, *Schonland* 3618, *Rogers* 2833; Albany district: Howison's Poort, *MacOwan*.

35. **P. obliqua** E. Mey.

An erect shrub up to 15 metres. *Stems* branched, villous when young, at length glabrescent, leafy. *Leaves* trifoliolate, petiolate, stipulate; petioles up to 6 mm. long; leaflets up to 3·1 cm. long and 1 cm. broad, elliptic-oblong, obtuse, mucronulate, densely glandular, glabrescent, shiny; lateral leaflets unequal sided. *Stipules* membraneous, about 6 mm. long and 2·5 mm. broad, ovate. *Flowers* axillary, in threes. *Pedicels* shorter than the leaves; sometimes three pedicels on short peduncle. *Calyx-tube* 2 mm. long, 7–8 mm. in diameter, nerved, glandular, villous; lobes villous, glandular, ciliate, glabrous on the inner surface; upper and lateral lobes 4–5 mm. long, 1–1·5 mm. broad, lanceolate, acute; lowest lobe up to 8 mm. long, and 3 mm. broad, ovate, very acute, almost cuspidate. *Vexillum* 9 mm. long, 7–8 mm. broad, obovate, with a channelled claw 1 mm. long; alae up to 1 cm. long, 3–4 mm. broad, with a linear claw 2–3 mm. long; carina 3–4 mm long, 2 mm. broad, with a linear claw 2–3 mm. long. *Ovary* glabrous; style 2·5 mm. long, glabrous.

Flowers: July–November.

Cape.—Stellenbosch district: Stellenbosch, *Duthie*; Caledon district: near Palmiet River, *Zeyher* 1525, Hottentots Holland Mountains, *Zeyher*; Paarl district: French Hoek, *Phillips* 1088.

36. **P. macradenia** Harv.

A shrub. *Stems* branched, erect, leafy, striate, glandular, silky canescent when young, becoming glabrous when older. *Leaves* trifoliolate, stipulate, sub-sessile; leaflets 1·9 cm. long, 8·5 mm. broad, obovate, cuneate, recurved mucronate, canescent when young, becoming glabrous, nigro-punctate on the upper surface with large and prominent glands on the lower surface. *Stipules* up to 2·5 mm. long, subulate, acute, canescent. *Flowers* axillary, 1–3 together. *Pedicels* short; sometimes three sub-sessile flowers on a short peduncle. *Calyx-tube* 3 mm. long, 7 mm. in diameter, veined, canescent, very sparsely glandular; lobes lanceolate-ovate, acute, sparsely glandular and canescent; upper and lateral lobes 3–4 mm. long, 1–1·5 mm. broad; lowest lobe 5·5 mm. long, 1·5 mm. broad. *Vexillum* 5 mm. broad, 6·5 mm. long, obovate, with a channelled claw 1·5 mm. long; alae 6·5 cm. long, 2 mm. broad, with a linear claw 3 mm. long; carina 4 mm. long, 2 mm. broad, with a linear claw 3 mm. long. *Ovary* glabrous; style 3·5 mm. long, glabrous.

Flowers: July–August.

Cape.—Riversdale district: Langebergen, *Muir* 1113.

37. **P. tomentosa** Thunb.

A shrub up to 24 metres. *Stems* erect, leafy, densely cano-pubescent, at length becoming glabrous. *Leaves* trifoliolate, petiolate, stipulate; petioles up to 2·5 cm. long; leaflets 0·6–4·5 cm. long, 0·5–1·8 cm. broad, elliptic or elliptic-lanceolate, mucronulate, with the upper surface glabrous or sparsely pilose and the lower surface densely canescent. *Stipules* up to 1·3 cm. long and 3 mm. broad, lanceolate, acute or subulate, cano-pubescent or glabrescent. *Inflorescence* axillary, or terminal. *Peduncles* up to 14 cm. long. *Flowers* in dense globose heads, sub-sessile; each flower subtended by a bract. *Bracts* up to 1 cm. long, ovate or lanceolate, villous, striate with dark lines. *Calyx-tube* 3–7 mm. long, 0·7–1·3 cm. in diameter, with reticulate veining, villoso-hirsute; lobes lanceolate, acute, reticulately veined, villous, pilose on the inner surface, ciliate; upper and lateral lobes 3–7 mm. long, 1–2·5 mm. broad; lowest lobe 0·75–1 cm. long, 2–3 mm. broad. *Vexillum* 7–8 mm. long, 2–8 mm. broad, obovate, geniculate, distinctly veined, with a channelled claw 2–5 mm. long; alae 4·5–8 mm. long, 2·3–5 mm. broad, with a linear claw 3·5–6 mm. long; carina 3–5 mm. long, 2–5 mm. broad, with a linear claw 5–6·5 mm. long. *Ovary* glabrous; style 5–7 mm. long. Glands present but very minute. The whole plant has a silvery appearance owing to the silky cano-pubescence.

Flowers: August–January.

Cape. George district: Outeniqua Mountains, *Hops* (*Bolus* 11795), *Schlechter* 5771, *Pappe*; Riversdale district: Riversdale, *Muir*; Knysna district: Knysna, *Duthie* 517, *Keet* 1025, *Williamson* 134, *Tyson* 973, *Keet* 856, *Zeyher*, Plettenberg Bay, *Rogers* 15450, 27061; Humansdorp district: Humansdorp, *Galpin* 3958, *West* 247, *Rogers* 2910, Witte Els Bosch, *Fourcade* 899, Ratels Bosch, *Fourcade* 69; Uitenhage district: Uitenhage, *Zeyher*; Albany district: Grahamstown, *MacOwan* 26, Featherstone's Kloof, *Bolus* 1939, Trapp's Valley, *Daly* 601, Howison's Poort, *Britten* 2980, *Glass* 17, Highlands, *Paterson*; Prince Albert district: Zwartberg Pass, *Bolus* 11476.

Localities Uncertain: Kleinmonde, *White* 946A, Inalgaten River, *Young* 5516.

38. **P. zeyheri** Harv.

A suffruticose, about 3 metres high. *Stems* slender, ascending, pubescent. *Leaves* trifoliolate, petiolate, stipulate; petioles up to 1·5 cm. long, striate, pubescent; leaflets 0·7–4·2 cm. long, 0·4–1·5 cm. broad, broadly obovate, mucronulate, villous, becoming glabrescent; a few of the upper leaflets linear to ovate-linear. *Stipules* adnate to the base of the petiole, up to 1·3 cm. long, subulate or lanceolate, acute, hispid, ciliate. *Inflorescence* terminal, and axillary, spicate. *Peduncles* 5·5–16 cm. long, hirsute. *Flowers* sub-sessile, each subtended by a bract. *Bracts* ovate or linear, acute. *Calyx-tube* 3–4 mm. long, 5–6 mm. in diameter, with dark and reticulate veins, densely albo-hirsute, lobes albo-hirsute, glabrous on the inner surface; upper and lateral lobes 3–8 mm. long, 0·5–1 mm. broad, linear-lanceolate; lowest lobe 5–9 mm. long, 1·5–2·5 mm. broad,

reticulately veined, ovate-lanceolate. *Vexillum* 0·6–1·2 cm. long, 5–7 mm. broad, obovate, with a channelled claw 0·5–3 mm. long; alae 6–9 mm. long, 1·5–3 mm. broad, with a linear claw 1–4·5 mm. long; carina 3–5 mm. long, 1–2 mm. broad, with a linear claw 4–5 mm. long. *Ovary* glabrous; style 6 mm. long, glabrous.

Flowers: November–January.

Cape.—Stellenbosch district: Palmiet River Mountains, *Stokoe* 17507: Caledon district: Caledon, *Zeyher* 2375, Houw Hoek, *Bolus* 6935, near Sir Lowry's Pass, *Schlechter* 9505, near Rooi Els, *Stokoe* 17342.

39. **P. Patersoniae** Schonl.

A shrub. *Stems* erect, striate, glandular-scabrid, tomentose, at length glabrescent. *Leaves* trifoliolate, stipulate, petiolate; petioles 3–5·5 cm. long; leaflets 1·5–5·5 cm. long, up to 4 cm. broad, obovate, acute, cuneate at the base, dentate-creniculate, mucronulate, nigro-punctate, glabrescent; lateral leaflets sub-sessile; terminal leaflets on petioles 0·7–2 cm. long. *Stipules* up to 1 cm. long, lanceolate, ovate, acute, tomentulose, glandular. *Inflorescence* axillary, spicate. *Peduncles* up to 6 mm. long. *Flowers* 2–3, subtended by a bract, shortly pedicelled. *Bracts* up to 1 cm. long, ovate, lanceolate, acute, tomentulose, glandular. *Calyx-tube* 2 mm. long, 5 mm. in diameter, tomentose, glandular; lobes lanceolate, ciliate, tomentose, glandular, glabrous on the inner surface; upper and lateral lobes 2–3 mm. long, 0·7 mm. broad; lowest lobe 5 mm. long, 1·5 mm. broad. *Vexillum* 5 mm. long, 4 mm. broad, obovate, with a channelled claw 1·5 mm. long; alae 5 mm. long, 1·5 mm. broad, with a linear claw 3 mm. long; carina 3 mm. long, 2 mm. broad, with a linear claw 3 mm. long. *Ovary* glabrous; style 3·5 mm. long, glabrous.

Flowers: December.

Cape.—Port Elizabeth district: Redhouse, *Paterson* 393 (Type).

40. **P. caffra** E. and Z.

An erect shrub up to 6 metres. *Stems* leafy, striate, with prominent glands, tomentulose, at length glabrescent. *Leaves* trifoliolate, petiolate, stipulate; petioles up to 1·8 cm. long; leaflets 1–4·5 cm. long, 0·7–3 cm. broad, broadly elliptic or obovate, rounded at the apex, mucronulate, thickly nigro-punctate, tomentulose, at length glabrescent; terminal leaflet on a petiole up to 1·1 cm. long. *Stipules* 2–5 mm. long, deltoid, acuminate, pilose. *Inflorescence* terminal or axillary, laxly or densely spicate. *Peduncles* up to 5 cm. long. *Flowers* in whorls of three subtended by a bract. *Bracts* up to 3 mm. long, ovate, acuminate, pilose. *Pedicels* about 1 mm. long. *Calyx-tube* 2–3 mm. long, 4·5–6 mm. in diameter, nerved, tomentose, nigro-punctate; lobes lanceolate, acute, tomentose, nigro-punctate, pilose on the inner surface; upper and lateral lobes 1·2–5 mm. long, 0·5–1 cm. broad; lowest lobe 2–4 mm. long, 1–1·5 mm. broad, acuminate. *Vexillum* 5–7 mm. long, 5–7 mm. broad, obovate, with a channelled claw 0·7–2·5 mm. long; alae 5–6·5 mm. long, 1·5–2·5 mm. broad, with a linear claw 2·5–4 mm. long; carina 3–3·5 mm. long, 1·5–2 mm. broad, with a linear claw 3–4·5 mm. long. *Ovary* pilose; style 3–4 mm. long, pilose. *Pod* membraneous, 5·5–7 mm. long, 3–4 mm. broad, hirsute, enclosed in calyx; seed small, hard and brown.

Whole plant has large conspicuous wart-like glands.

Cape.—Cape district: Fort Beaufort district: Hogsback, *Rattray* 32A: Queenstown district: Katberg, *Bolus* (*Herb.* 1993), *Galpin* 2068, between Kat and Kei Rivers, *Zeyher* 1550: Cathcart district: Cathcart, *Galpin* 7361: Stutterheim district: Stutterheim, Mountains above Dohne, *Flanagan* 2294: Komgha district: Komgha, *Flanagan* 2319: Cala district: *Kolbe* and *Pegler* 1740: Griqualand East: Clydesdale, *Tyson* 1220, 1260, 2526.

Natal.—Drakensberg, Giants Castle, *Wylie* (*Wood* 10674): Polela, *Evans* 659: Mahwaqua Mountains, *Evans* 225: Lidgetton, *Wood* 6320: Byrne and Richmond, *Wood* 1847: Maritzburg, *Hutton* 315; Umgeni, *Cooper* 1148; Umkomaas, *Wood*; Zuurberg, *Wood* 338.

Transvaal.—Lydenburg district: Elandspruitberg, *Schlechter* 3889, *Pegler* 1740 is probably from Kentani.

41. **P. venusta** E. and Z.

A. suffruticose. *Stems* flexuous, appressedly pubescent. *Leaves* trifoliolate, stipulate, sub-sessile; leaflets 2·5 cm. long, 6–7 mm. broad, cuneate-oblong, obtuse, mucronulate, pellucid-dotted, appressedly puberulent. *Stipules* subulate. *Inflorescence* terminal and axillary, spicate, cylindric. *Peduncle* and spike up to 4 cm. long. *Bracts* subtending flowers half as long as the calyx. *Calyx-tube* 6 cm. long, silky canescent, lobes lanceolate, acuminate, glandular; lowest lobe longest, nearly equalling the petals.

Cape.—Malmesbury district: Saldanha Bay, *Ecklon* and *Zeyher* 1553.

Description taken from "Flora Capensis." No specimen seen.

42. **P. hirta** Linn.

A branched shrub. *Stems* erect, rigid, canescent with appressed short hairs, sparsely leafy. *Leaves* trifoliolate, petiolate, stipulate; petioles not exceeding 5 mm. long; leaflets 0·5–1·5 cm. long, 4–9 mm. broad, cuneate, obovate, recurved-mucronate, canescent, glandular. *Stipules* adnate to the base of the petiole, small, subulate. *Inflorescence* axillary or in interrupted spikes. *Flowers* in whorls of three, sessile, bracteate. *Calyx-tube* 3–4 mm. long, 6–7 mm. in diameter, glandular, villous; lobes slightly unequal, 1–5 mm. long, 0·75–2 mm. broad, linear-lanceolate to lanceolate-ovate, acute, villous, pilose on the inner surface. *Vexillum* 5–7 cm. long, 4–5 mm. broad, obovate, with a claw 1–3 mm. long; alae 4–6·5 mm. long, 1–2·5 mm. broad, with a linear claw 3 mm. long; carina 3–4 mm. long, 1 2 mm. broad, with a linear claw 3–4 mm. long. *Ovary* glabrous or hirsute; style 3–4 mm. long, glabrous or hirsute.

Flowers: October–November.

Cape.—Tulbagh district: Winterhoek, *Zeyher*; Cape district: Blaauwberg, *Zeyher*, near Milnerton, *Forbes* 229; without locality, *Bolus* 2993; Stellenbosch district: Stellenbosch, *Ecklon* and *Zeyher*, Somerset Strand, *Rogers* 17675; Paarl district: Paarlberg *Drege*; Caledon district: Sir Lowry's Pass, *Bolus* 9195.

43. **P. stachydis** L.f.

A branched shrub. *Stems* erect, rigid, villous, with spreading rusty hairs, becoming glabrous when older. *Leaves* trifoliolate, petiolate, stipulate; petioles up to 3 mm. long: leaflets 0·5–2·5 cm. long, 0·4–1·5 mm. broad, obovate, acute or obtuse, hirsute, recurved mucronate, glandular. *Stipules* adnate to the base of the petiole, subulate. *Inflorescence* axillary and terminal, in laxly flowered spikes. *Peduncles* up to 5 cm. long. *Flowers* in whorls of three. *Bracts* small. *Calyx-tube* 3–4 mm. long, 6 mm. in diameter, villous, glandular; lobes ovate-acuminate or sub-lanceolate, villous, glandular, glabrous or sparsely pilose on the inner surface: upper and lateral lobes 2–4 mm. long, 0·5–1·5 mm. broad; lowest lobe 3·5–5 mm. long, 1·5–2 mm. broad. *Vexillum* 7 mm. long, 5–7 mm. broad, obovate, with a linear claw 1–3 mm. long; alae 5·5–6·5 mm. long, 2-3 mm. broad, with a linear claw 3 4 mm. long: carina 3–4 mm. long, 1·5–2 mm. broad, with a linear claw 3–4 mm. long. *Ovary* thinly pilose or glabrous; style 4–5 mm. long, glabrous.

Flowered: October.

Cape.—Piquetberg district: Piquetberg, *Bolus* 3458, 7529; Cape district: Table Mountain, *Zeyher*.

44. **P. spicata** L.

A shrub. *Stems* erect, virgate, pubescent, glabrescent, glandular, leafy. *Leaves* trifoliolate, petiolate, stipulate; petioles up to 4 mm. long; leaflets up to 3 cm. long, 9 mm. broad, obovate or obovate-oblong, obtuse, recurved mucronate, thickly nigro-punctate, slightly hirsute, especially along the mid-rib and veins. *Stipules* adnate to the base of the petiole, up to 5 mm long, subulate, acute, glandular. *Inflorescence* terminal, sessile, a

densely flowered spike. *Bracts* small. *Calyx-tube* 3–4 mm. long, 5–8 mm. in diameter, veined, pubescent, glands few; lobes lanceolate-ovate, acute, long ciliate, more thickly glandular than the tube, shortly pilose on the inner surface; upper and lateral lobes 1·5–3·5 mm. long, 1–2 mm. broad; lowest lobe 3–5 mm. long, 1–2 mm. broad. *Vexillum* 4–6 mm. long, 4·5–5 mm. broad, obovate, slightly geniculate, with a channelled claw 2 mm. long; alae 3·5–6 mm. long, 1·5–2 mm. broad, with a linear claw 2·5–3 mm. long; carina 2–3 mm. long, 1–1·5 mm. broad, with a linear claw 3–4 mm. long. *Ovary* glabrous; style 3–4 mm. long, glabrous.

Flowered: September–February. Flowers: Colour, pale blue. Plants about 2–3 feet high.

Cape.—Cape district: Capetown, *Bolus* 1429, near "Protea," *Bolus* (*Herb.* 7101), Wynberg, *Bolus* (*Herb.* 7101b), Table Mountain, *Zeyher* (?) (Ex. Herb. Gub.); Paarl district: French Hoek, *Phillips* 1091; Swellendam district: Swellendam, *Zeyher* 2374; Riversdale district: Riversdale, *Muir* 83; George district: George, *Paterson*; Knysna district: Forest Hill, *Duthie* 740, Plettenberg Bay, *Ecklon* and *Zeyher* 1546; Albany district: Zuurberg, *Schlechter* 5702, Hofman's Bosch, *Britten* 1028; East London district: East London, *Rattray* 186; Komgha district: Komgha, *Flanagan* 403.

45. **P. racemosa** Thb.

A suffruticose. *Stems* flexuous, slender, pubescent, becoming more or less glabrous, glandular, leafy. *Leaves* trifoliolate, shortly petiolate, stipulate; petioles up to 2·5 mm. long; leaflets up to 1·8 cm. long, 8 mm. broad, cuneate-oblong, flat, obtuse, mucronulate, coriaceous, hispidulous, glabrescent, nigro-punctate, especially near the margins. *Stipules* up to 4 mm. long, subulate, veined. *Inflorescence* terminal, interrupted or axillary. *Flowers* sessile, 2–3 together. *Calyx-tube* 3 mm. long, 5 mm. broad, veined, glands few, translucent, hispid along veins, otherwise glabrous; lobes linear-lanceolate, acute, ciliate, hispid, glands translucent, shortly hispid on the inner surface; upper and lateral lobes 3·5–4 mm. long, up to 1 mm. broad; lowest lobe 5·5 mm. long, 1·5 mm. broad. *Vexillum* 8 mm. long, 6·5 mm. broad, obovate, with a claw 1·5 mm. long; alae 9 mm. long, 3 mm. broad, with a linear claw 2·5 mm. long; carina 3 mm. long, 2 mm. broad, with a linear claw 3·5 mm. long. *Ovary* glabrous; style 3 mm. long, glabrous.

Flowers: October.

Cape.—Riversdale district: Garcia's Pass, *Bolus* 11264; George district: Langekloof, *Ecklon* and *Zeyher*.

46. **P. hamata** Harv.

A shrub. *Stems* erect, striate, virgate, with a few scattered glands, canescent, becoming glabrous. *Leaves* trifoliolate, sub-sessile, stipulate; leaflets up to 2 cm. long and 1 cm. broad, obovate, obtuse, recurved-mucronate, thickly glandular, canescent when young, becoming glabrous. *Stipules* up to 2·5 mm. long, subulate, acute. *Inflorescence* terminal, spicate, sessile. *Calyx-tube* 3 mm long, 7 mm. in diameter, glandular, canescent; lobes ovate, acuminate, glandular, canescent, shortly pilose on the inner surface; upper and lateral lobes 1·5–3 mm. long, up to 1·5 mm. broad; lowest lobe 4 mm. long, 2 mm. broad. *Vexillum* 5 mm. long, 4·5 mm. broad, obovate, with a channelled claw 2·5 mm. long; alae 4·5 mm. long, 2 mm. broad, with a linear claw 3 mm. long; carina 3 mm. long, 2 mm. broad, with a linear claw 4 mm long. *Ovary* pilose; style 4 mm. long. *Pod* membraneous, pubescent, with persistent calyx; seed small, hard and brown.

Flowered: January.

Cape.—Worcester district: Hex River, near De Doorns, *Bolus*.

Namaqualand Minor.—Without precise locality, *Scully* 1137.

47. **P. Wilmsii** Harms.

A tall shrub. *Stems* thinly pubescent, leaves 2–3 cm. equidistant. *Leaves* trifoliolate, petiolate, stipulate; petioles up to 4 mm. long; leaflets up to 4·5 cm. long and 1·3 cm. broad, oblanceolate to oblanceolate-ovate, obtuse, recurved mucronate, nigro-punctate, thinly pubescent, becoming glabrous, sessile or sub-sessile. *Stipules* lanceolate, acuminate, glandular, thinly pubescent. *Inflorescence* terminal and axillary, spicate. *Peduncles* up to 2·8 mm. long. *Flowers* in threes subtended by a common bract. *Calyx-tube* 2·5 mm. long, 5·5 mm. in diameter, veined, glandular, hirsute: lobes ovate, glandular, hirsute, ciliate, hirsute on the inner surface: upper and lateral lobes 1·5–2 mm. long, up to 1 mm. broad; lowest lobe 2·5–3 mm. long, 1–1·5 mm. broad. *Vexillum* 6–6·5 mm. long, 5·5–6 mm. broad, ovate or obovate, with a linear claw 1·5–2·5 mm. long: alae 6 mm. long, 2–2·5 mm. broad, with a linear claw 2·5–3 mm. long; carina 3–4 mm. long, 1·5–2 mm. broad, with a linear claw 3–3·5 mm. long. *Ovary* pubescent; style 3·5–4 mm. long, pilose.

Flowers: July–January.

Transvaal.—Zoutpansberg district: The Downs, *Rogers* 20209: Lydenburg district: Elandspruitberg, *Schlechter* 3889: Ermelo district: Mavierstad, *Pott* 5086.

Swaziland.—Without precise locality, *Bolus* 11794.

48. **P. striata** Thb.

A virgate shrub. *Stems* erect, striate, leafy, canescent. *Leaves* trifoliolate, petiolate, stipulate: petioles not exceeding 5 mm.: leaflets 0·7–3·5 mm. long, 0·4–1·7 cm. broad, obovate to obovate-oblong, recurved mucronate, nigro-punctate, thinly canescent, becoming almost glabrous when older. *Stipules* lanceolate, acute, nigro-punctate, canescent. *Inflorescence* terminal and axillary, spicate. *Spikes* sometimes lax and interrupted. *Peduncles* up to 2·5 cm. long. *Calyx-tube* 2·5–4 mm. long, 6–7 mm. in diameter, glandular, canescent: lobes ovate to lanceolate-ovate, acute, glandular, canescent, glabrous or pilose on the inner surface; upper and lateral lobes 1–3 mm. long, 0·75–1·5 mm. broad; lowest lobe 1·5–5 mm. long. *Vexillum* 6–7 mm. long, 4–5 mm. broad, obovate, with a claw 1–3 mm. long; alae 4–5 mm. long, 1·5–2 mm. broad, with a linear claw 3–4 mm. long; carina 3–4 mm. long, 1·5–2 mm. broad, with a linear claw 3–4 mm. long. *Style* 3–4 mm. long, pilose or glandular. *Pod* membraneous, 1–4 cm. long, 4 mm. broad, pubescent, with the persistent calyx; seed up to 1 cm. long, hard and brown.

Cape.—Clanwilliam district: Olifant's River, *Zeyher* 1556: Swellendam district: Gauritz River, *Zeyher* 1551: Oudtshoorn district: Oudtshoorn, *Britten* 134.

Var. *gracilis*. Plant more slender and laxly leafy. Flowers fewer and smaller, 1–3 subtended by a common bract. Flowers on long terminal rhachi.

Namaqualand.—Between Brakdam and Rietkloof, *Pillans* 5667.

49. **P. Royffei** n. sp.

Stems striate, younger parts clothed with yellowish pubescence. *Leaves* trifoliolate, petiolate, stipulate; petioles up to 6 mm long; leaflets up to 2·3 cm. long and 1·3 cm. broad, elliptic-lanceolate to elliptic-obovate, mucronulate, densely nigro-punctate, pubescent on lower surface. *Stipules* up to 5 mm. long, subulate, acute, glandular, pubescent. *Inflorescence* terminal, spicate. *Peduncles* up to 1 cm. long. *Flowers* sessile or very shortly pedicelled, 2–3 together subtended by a bract. *Calyx-tube* 2·5 mm. long, 6 mm. in diameter, pubescent, glandular; lobes acute, pubescent, ciliate, glandular, pilose on the inner surface: upper and lateral lobes 2·5–3 cm. long; lowest lobe 4 mm. long, 1·5 mm. broad. *Vexillum* 7 mm. long, 6 mm. broad, obovate with a short claw 2 mm. long; alae 6·5 mm. long, 2 mm. broad, with a linear claw 3 mm. long; carina 3·5 mm. long, 2 mm. broad, with a linear claw 3·5 mm. long. *Ovary* pilose; style 3 mm. long, pilose.

Flowered: October. Flowers: Yellow.

Cape.—Tembuland, Cala, *Royffe* 161.

A Drying Cabinet for the Preparation of Plant Specimens for the Herbarium.

By A. P. D. McClean, Natal Herbarium, Durban, and H. H. Storey, East African Agricultural Research Station, Amani.

INTRODUCTION.

The Drying Cabinet, which is described in this paper, is the outcome of our attempt to meet the extreme difficulty of drying plants under the normally highly humid conditions of the Durban climate. By the ordinary plant-press method, the drying is a lengthy process and even by exercising the greatest care the specimens are of poor quality, frequently rendered valueless by the development of moulds.

The general principle of our drier evolved from a conversation several years ago with Mr. G. H. Cunningham, of New Zealand. He is understood to have a machine of similar type in operation, but no description appears to have been published. In view of the interest which many visitors have shown in our drier, it appears advisable to make a description available. We acknowledge our obligation to Mr. Cunningham for the basic idea, though we, in collaboration with the Public Works Department, are responsible for the details of this design.

DESCRIPTION OF THE DRYING CABINET.

The principle of our method of drying is as follows:—The plants to be dried are laid between sheets of drying paper in the customary manner and subjected to a suitable degree of pressure. Hot air is then drawn through the pile, the air passing through the interstices between the sheets.

The cabinet, constructed of stout, well-seasoned teak, consists of a Pressing or Drying Chamber and a cupboard divided by a shelf into two compartments, an upper oven and a lower heating chamber. These features are illustrated in the accompanying photographs and diagrams.*

The Pressing or Drying chamber is 10″ × 1′ 8″ × 1′ high and can accommodate approximately 100 plant specimens of a size suitable for the average mounting sheet. This chamber is fitted with a lid consisting of a flat base with an attached letterpress screw and screw block. The latter is maintained in a fixed position by means of a slotted arm which fits over two hold-fasts screwed to the sides of the chamber. By this means the lid can be lowered or raised at will. In addition the lid has certain features to procure as nearly as possible an air-tight joint with the sides of the chamber. Pieces of solid rubber beading of the desired length are held in movable steel holders attached by means of slotted iron clips to the upper edges of the lid. When the lid is in the desired position, the rubber bead can be made to press firmly against the walls of the chamber by means of 4 pivoted cleats. Triangular pieces of rubber are provided for the corners, the ends of the steel holders and the beadings being cut in such a way as to allow for the fitting of the corner pieces.

* Acknowledgment is made to Mr. L. H. Godfrey, District Draughtsman, Public Works Department, Natal, for the diagram drawings.

The Heating Chamber of the dimensions 10″ × 1′ 8″ × 8″ is asbestos lined and equipped with 3 Revo electric fire-baths, each consuming 500 watts. By means of a 3-way control switch either one, two, or three of the units can be brought into operation. An iron shelf divides the heating chamber from the oven. Access is provided to the cupboard by means of a felt-lined door equipped with a fastening catch bevelled to create pressure on closing. Air is drawn through the system by a Sturtevant ½ H.P., 2,750 R.P.M. exhausting fan, attached to the side of the drying chamber, communication with which is provided through a narrow vent at its base. Air enters the system through a small opening in the base of the heating chamber—passes over the electric fire-baths, through an opening in the cupboard shelf and enters the drying chamber through five holes in the roof of the oven, at the end opposite to that carrying the fan. Hot air therefore enters the drying chamber at this end and is drawn by the fans horizontally through the pile of drying papers and plants, which lie compressed between the base of this chamber and the screw-down lid. Temperature is observed by means of a thermometer which passes through the wall of the cabinet into the oven at the point where the air enters the drying chamber.

PROCEDURE.

The plant specimens are arranged in the usual way between sheet of some absorbent material such as blotting paper ; three sheets between each has been found generally suitable, The sheets are cut 10″ wide so as to fit exactly into the drying chamber. A fairly high degree of pressure can be maintained on the specimens without seriously retarding the passage of air through the system. The fan is then set in motion and the heating switch turned to high. In this position the temperature measured by the thermometer already mentioned rises to about 150° C. after an hour. The switch should then be turned to medium which maintains the system at a temperature between 130° C. and 150° C. It is not desirable to keep the three heating units in action for long periods as this will tend to cause over-heating, the specimens becoming brittle and crumbling when handled. A drying temperature of about 130° C. to 140° C. seems to be the most satisfactory. The switch may be turned to low after four or five hours.

The average plant specimen of a woody nature and not of an unduly high degree of succulency requires about an 8-hour treatment. Delicate herbs can be dried in under four hours, while excessively succulent plants of the Aloe type require up to 16 hours.

For seaweeds a low temperature is recommended and we have found it advisable to keep the switch at low, as high temperatures tend to remove the colouring matter.

The oven was included to make provision for the drying of such botanical specimens as fleshy fungi. An excellent result was obtained with a species of Polyporus and complete drying was effected in eight hours at a temperature of 70° C. We have no doubt that many uses will be found for this additional drying chamber.

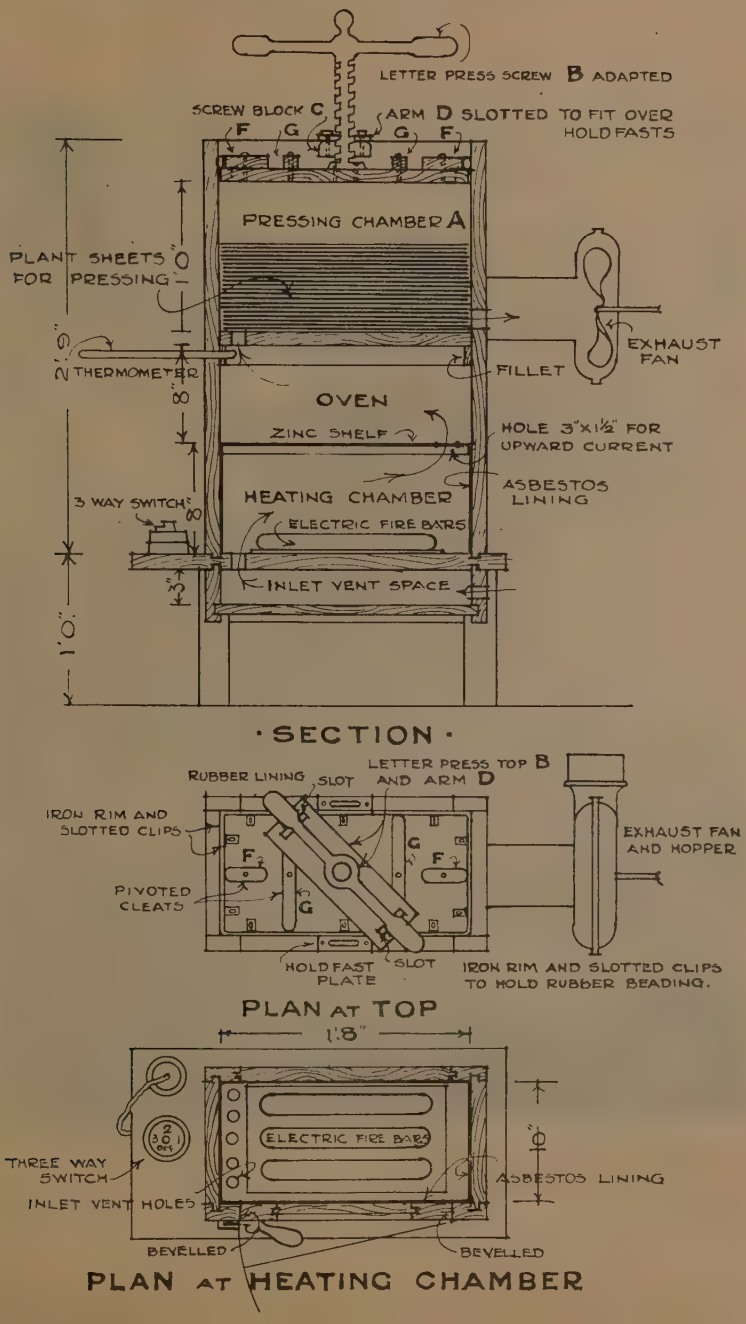
DISCUSSION.

Our method not only provides for the very rapid drying and preparation of herbarium specimens, but yields results of an excellent quality.

The finished specimens do not possess the brittleness which so frequently is associated with certain plants prepared by the usual slow method of drying. Moreover, colours are retained very much better and there is less vegetative distortion. We have little doubt it will overcome many of the difficulties encountered with some natural families of which the preparation of dried specimens gives normally much trouble

We commend this piece of apparatus to those in charge of Herbaria situated in the Tropics and other regions of high humidity.

DRYING CABINET



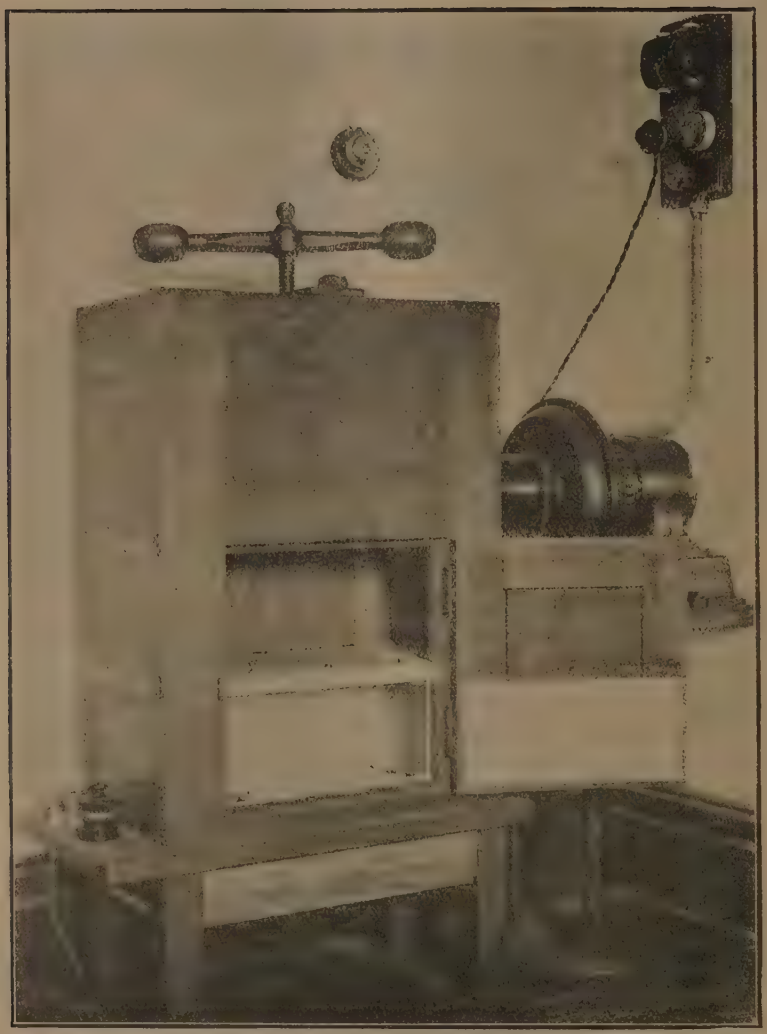
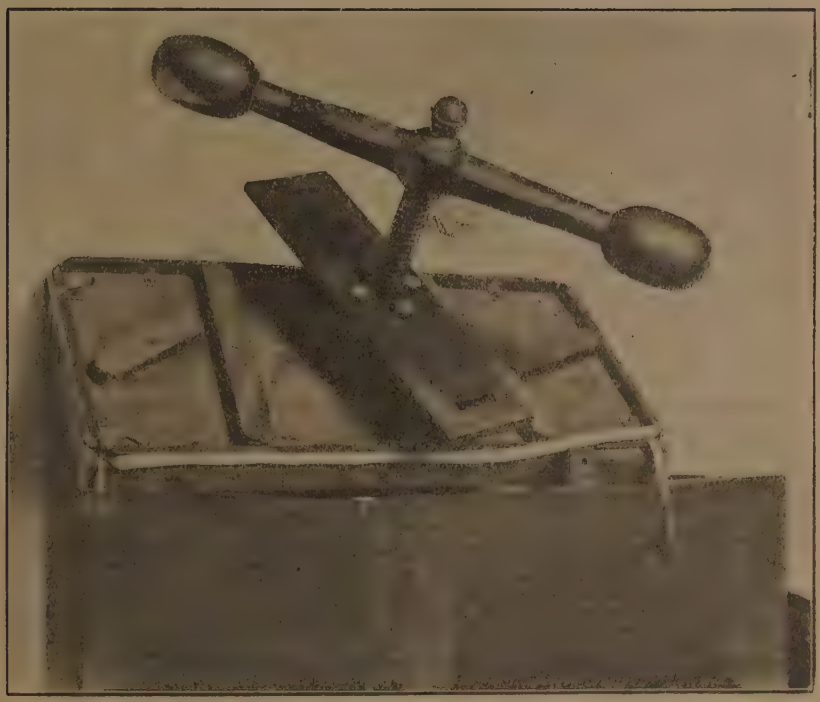


Plate II.—Lid of the Cabinet—Showing Details of Design.



EXPLANATION OF PLATES.

Plate I.—Drying Cabinet with the Lid in Position.

Notes on *Aloe spicata* Linn. fil.

By R. Marloth.

The identification of our older species of Aloe from descriptions and illustrations has offered many difficulties, for nearly all these diagnoses were based upon plants cultivated in European conservatories, that means, they had grown up in an environment with a considerably moister atmosphere and a far less sunny climate. Under such conditions these highly succulent plants generally assume quite a different habit, not only in stem and foliage, but also in the nature of their inflorescence. Consequently when Volume VI of the Flora Capensis appeared in 1897 comparatively few of our wild species of Aloe were known correctly by name, although some of them had been in cultivation in Europe for two centuries. They differed to such an extent from the available descriptions that recognition became possible only through a study of plants from various localities and of their behaviour under cultivation in our gardens. A few of the species of which the natural home was not known 25 years ago are the following: —*Aloe succotrina*, *A. purpurascens*, *A. microstigma*, *A. obscura*, *A. glauca*, *A. falcata*, *A. grandidentata*, *A. pluridens*, *A. Salmdyckiana* and the subject of this article, viz. *A. spicata*. For all these, with the exception of the last named, the difficulties and doubts have been gradually overcome, and we are now fairly certain of their identity and localities of occurrence in the country.

With regard to the last one in the list, viz., *A. spicata*, the writer considers that he has at last solved this puzzle, for Linnaeus' *Aloe spicata* is the plant now usually called *A. speciosa*.

Before discussing the reasons for this conclusion it appears advisable to quote the descriptions of *Aloe spicata*, as given in the three principal publications dealing with the plant, viz.:

Linnaeus fil. Supplementum, 205 (1781).

Thunberg, Flora Capensis, Edit. Schultes, page 309 (1823).

J. G. Baker, Flora Capensis, Vol. VI, page 316 (1896).

Linnaeus fil. Supplementum, 205 (1781).

"*Aloe spicata*. Caulescens, foliis planis, ensiformibus, dentatis, floribus spicatis, campanulatis, horizontalibus."

Thunberg in Flora Capensis, Edition Schultes, page 309 (1823).

"Crescit in Promontorii Bonae Spei interioribus regionibus. Floret Augusto."

"Caulis teres apice foliosus, 3–4 pedalis, crassitie brachii. Folia subverticillata, carnosa, basi lata sensim attenuata, canaliculata, dentibus remotis, patentia bipedalia. Flores densissime approximati horizontaliter patentes; spica pedalis sensim florens. Bractea sub singulo flore solitaria ovata acuta lata membranacea alba, striis 3 viridibus, corolla paulo brevior. Corolla subhexapetala; laciniae 3 interiores invicem non connatae, latiores, ovatae, obtusae, albae, carina linea triplici viridi, unguiculares: tres exteriores basi cum interioribus connatae, angustiores, ceterum similes, minus concavae. Filamenta linearia sensim parum attenuata, basi alba, superne flavescentia, inaequalia, erecta, corolla sesquilongiora. Antherae ovatae, incumbentes, fulvae. Stylus flexuosus erectus, longitudine fere staminum. Stigma simplex obtusiusculum. Capsula ovata, obtusa, subtrigona, inflexa, hinc carinata, lateribus planis quadristriata, inde convexa sulco medio glabra. Dissepimentum duplicatum. Corollae repletae succo melleo purpurascente."

Baker in Flora Capensis, Vol. VI, page 316 (1896).

A. spicata Linn. fil.

" Stem elongated below the leaves, simple ; leaves 12–20, laxly disposed, patent or the lower recurved, ensiform, 18 inches long, 1½ to 2 inches broad low down, 6 lines thick in the centre, tapering gradually from the middle to a long point, green with a slight glaucous tinge, obscurely lineate towards the base, mottled with copious irregular whitish oblong spots ; margin with spreading, horny, deltoid-cuspidate prickles 1½ to 2 lines long ; peduncle slender, simple or forked, above a foot long ; raceme oblong, 6 inches long ; pedicels ascending, 6–9 lines long ; bracts small, lanceolate ; perianth bright yellow, tinted with red when young, 15 lines long, tube short ; stamens slightly exserted."

A comparison of these accounts shows that they cannot refer to the same species, and as Mr. Baker states that his description of the flower was taken from a plant cultivated by Mr. Peacock (1879), it is obvious that that plant had been wrongly named, and that Haworth, whom Baker followed otherwise, had also erred in applying Linnaeus' name to a plant with speckled leaves, for neither Linnaeus nor Thunberg mention the spots on the leaves, which they could not have overlooked, nor does the latter call the inflorescence forked and the flowers yellow. The erroneous views of these authors are probably the principal cause which has prevented the recognizing of the true *A. spicata* up to the present.

A further proof that Haworth and Baker were mistaken in their identification is afforded by Mr. N. E. Brown's study of Thunberg's type specimen collected by him about the year 1776 and preserved in his herbarium at Upsala. Mr. Brown's account is published in Bothalia, Vol. I, page 142 (1922), and runs as follows (omitting his comments) :—

A. spicata Linn. fil., ex Suppl. p. 205 (1781), and Thunb. Flora Capens., page 309.

" Thunberg's specimen is the type of this species and consists of portions of two leaves and six detached flowers. The leaves are resp. 10¾ and 13¾ inches long and 14 and 16 lines wide at their basal ends, gradually tapering thence into a long and slender subulate point which at 3 inches below the acute or bluntish tip is only 2 lines broad. . . . The teeth on the margins are 6–8 lines apart and very small, being not more than half a line long ; the apical spine is also small. The margin between the spines is straight or very faintly concave. The flower stem and pedicels are absent, but the flowers may have been sessile. One flower has what appears to be a bract attached to it, which is 6 lines long and 5 lines broad, and is broadly elliptic, obtuse, 3-nerved. The perianth is campanulate in shape, 7 lines long and 5 lines in diameter as pressed, but is probably of nearly the same dimensions when alive. The segments are nearly 3 lines broad, ovate-oblong, obtuse, 3-nerved ; they all appear to be free to the base and are not recurved at the apex. According to Thunberg they are white, with three green veins. The stamens are exserted 3-4 lines beyond the tips of the perianth segments with stout purple filaments half a line broad."

It will be seen that—

1. The leaves of the type are not mottled.

2. The marginal prickles are " very small, being not more than half a line long," while Mr. Baker's plant had " spreading, horny, deltoid-cuspidate prickles 1½ to 2 lines long."

It is obvious that Mr Baker's statements cannot be reconciled with Thunberg's and Brown's descriptions.

Having recently had occasion to study a population of hybrids* between *A. ferox* var. *supralaevis* and *A. speciosa* Baker, and comparing them with living material of both parents from various sources, the writer noticed that Baker's description of his *A. speciosa* agreed remarkably well with Mr. Brown's description of Thunberg's type specimen of *A. spicata*, and combining this account with Thunberg's own diagnosis it became obvious that Baker's *A. speciosa* was *A. spicata* Linn. fil.

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* The hybrid has been named *A. Tomlinsonii* and is figured and described in *South African Gardening*, October, 1929.

Aloe spicata L. fil. and *A. ferox*. Hillside at Alicedale. August. The plant in the foreground and the others with deflexed leaves and simple spike or spikes are *A. spicata*; those with stiffly erect leaves and branched inflorescence are *A. ferox*. [*Photo by* R. Marloth.

Aloe spicata L. fil. Hillside near the Breede River, 15 miles south of Swellendam. Nearly all the older plants here are branched at the top and bear several spikes. August.
[*Photo by* L. L. Tomlinson.

Baker's description of *A. speciosa* (Flora Cap., Vol. VI, 323), taken over from the *Journ. Linn. Soc.* XVIII, 178), is as follows :—

" Habit of *A. africana*, reaching a height of 20–25 feet ; leaves in a dense rosette, 15–18 inches long, 2 inches broad low down, ensiform, glaucous, with smaller and weaker prickles than *A. africana* ; peduncle short, stout, simple ; raceme very dense, simple, a foot long, 4 inches in diameter when expanded, all except the upper flowers deflexed, pedicels 2–3 lines long ; bracts sub-orbicular, obtuse, 6 lines long and broad ; perianth cylindrical, 15 lines long, rose-tinted in an early stage only, greyish white when mature : tube scarcely any ; stamens and style bright red, conspicuously exserted." Somerset East, MacOwan No. 1922.

Note by the Writer.—A. speciosa is quite different in habit from *A. africana*, and never reaches a height of 20 feet. The only similarity would be that both are arborescent, with a trunk 6 to 10 feet high, but so are quite a number of others. The perianth, when fresh, is always more or less clavate and constricted at the mouth, as shown very well in Berger, Aloineae Das Pflauzenreich, page 300.

If one remembers that Baker's description was drawn up from a dried specimen, and if one corrects the statements about similarity to *A. africana* and the height of the plant, which are erroneous as every one who knows the fairly widely distributed *A. speciosa* Baker will confirm, this description of *A. speciosa* agrees very well with Thunberg's type of *A. spicata*, as redescribed by Mr. Brown.

There are, however, a few minor points in Thunberg's description of the flower which call for special consideration.

1. The bracts are described as " little shorter than the flowers," while in *A. speciosa* they are about one-third the length of the fully developed flowers.

2. The filaments are described by Thunberg as " white at base and yellowish higher up," while in *A. speciosa* they are yellowish at the included part and dark brown or purplish brown in the projecting part.

3. The nectar in the flowers is said to be purple, while it is colourless or yellowish in fresh flowers of *A. speciosa*.

The discrepancy concerning the bracts has been disposed of by Mr. Brown's account of Thunberg's type specimen.

With regard to the colour of the filaments Mr. Brown finds that in the type they are purple . . . whatever their original colour may have been.

On the third point I have made an observation which disposes of that as well, viz. : if older fresh flowers are placed between paper, the nectar, if there is any, although originally colourless, soon dissolves the pigment of the filaments and stains the paper purple while the filaments themselves become paler.

Taking all these observations together and considering the unusual colour of the perianth, viz. : white with green lines, there is no point left that would be inconsistent with the view that *Aloe speciosa* Baker is *Aloe spicata* Linn. fil.

It is noteworthy that Berger's studies of these plants had led him to the conclusion that " Haworth's identification was probably wrong and that *A. spicata* has its nearest ally in *A. speciosa* Baker." (Aloineae, page 301). The foregoing discussion will show that we have to go a step further and consider them to be synonymous.

After the foregoing note on *Aloe spicata* had been written Dr. Pole Evans drew my attention to an article in the Gardener's Chronicle of June, 1921, page 6, by Mr. N. E. Brown of Kew, on *Aloe spicata*. In this article I find the following passages quoted by the author :

(*a*) From Thunberg's dissertationes on Aloe : " *the purest and best juice of aloes is obtained from this species.*"

(*b*) From Linnaeus fil. Supplementum, page 205 (1781) : " *from the juice of this species the best gum-resin of aloes is prepared, from the rest of the species the cheaper kinds.*"

Obviously Linnaeus had merely repeated the information received from Thunberg, but it should be noted that Thunberg has omitted this statement from his Flora Capensis—perhaps it had been recognized in the meantime as erroneous. Whether the drug or some variety of the drug was ever prepared from this species on a commercial scale or not does not concern us here. The importance of the statement is in the fact that Thunberg's specimen must have come from a district where the drug aloes was being manufactured—and that information settles the point at issue, for when Thunberg stayed at the Cape (1775) such manufacturing was carried out only in the Swellendam district which then embraced also the country now forming the districts of Riversdale and Mossel Bay, and in that area occur only two species of tree aloe, viz., *Aloe ferox* and *A. spicata* (*A. speciosa*). That the other kind "*from which the cheaper quality of aloes was obtained*" is *A. ferox* is now generally admitted. In fact, at present no other species is used at all for this purpose, and it is remarkable that the farmers in those districts call *A. ferox* simply the "alwij," while *A. spicata* is one of the "wilde alwij," because it cannot be used for the manufacturing of the drug. Whether 150 years ago some attempts were made to prepare a different kind of drug from *A. spicata* as well as from *A. ferox*, or whether Thunberg's informant confused the two species could hardly be elucidated at the present time. It should be remembered that Thunberg did not see the plant in its wild state, for he merely states that it grows in the interior, which means anything beyond Stellenbosch. He must have obtained his specimen either from a garden at Capetown or it was sent to him by a correspondent.

Postscript.—When writing the foregoing notes for publication in Bothalia I sent an illustration of the hybrid *Aloe Tomlinsonii* to South African Gardening, where it appeared in November, 1929, with the following footnote:—

"The plant described by Baker in 1880 under the name *A. speciosa* and now generally known as such has been recognized to be identical with speciments described by Linnaeus the younger and Thunberg as *A. spicata*, hence the former name becomes a synonym for the latter. The reasons for this change of name will be given in the forthcoming number of Bothalia (Pretoria, 1929.)"

The view on *Aloe spicata* expressed therein is contradicted by Mr. N. E. Brown, Kew, in a letter to the Editor of S.A. Gardening, published in the May number, 1930, of that journal, just at the time when the proof of the foregoing article reached me. I cannot help expressing my regret that Mr. Brown, a highly esteemed friend, should have rushed into print instead of awaiting the appearance of my notes, of which he had notice, for he does not put forward any new observation and merely reiterates what he published 8 to 10 years ago and what is quoted above.

His statement in that letter: "the two species have not the slightest resemblance to one another" is in direct conflict with Berger's view that: "*Aloe spicata* has its nearest ally in *Aloe speciosa* Baker" (Aloineae, page 305),* especially if one remembers that this author based his conclusions on plants grown and flowered by him at La Mortola year after year and not only on herbarium specimens, as Mr. Baker and Mr. Brown had to do.—R.M.

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* See Das Pflanzenreich, IV, 38, III, 2. Liliaceae-Aloineae (1908.)

South African Gramineae.

Some new species of Digitaria.

By Sydney M. Stent.

The following species and varieties of *Digitaria* with the exception of *D. apiculata* and *D. trichopodia* have been described from living plants that were collected from many different and widely separated localities in the Union of South Africa and brought to the Government Experiment Station Prinshof at Pretoria where they have become well established. There is a pure stand of each grass of about 1/40 acre in size so that in describing the species I have been able to study a very large number of plants of each.

I have found it exceedingly difficult, in many cases to describe the grasses so that they may be recognized from the herbarium sheet, in the field the differences, especially in the vegetative habit, are so marked that it is impossible to class them as one species, but on the sheet naturally these characters are not so obvious, and I am not surprised that systematists who have only had dried material with which to work have classified most of these grasses under *D. eriantha* adding forma or var. to account for any variations observed. As it is I have only, out of the mass of material studied—some 60 separate stands—classified 16 as distinct species of which 11 are new, although the Agriculturist claims that no two stands are exactly alike and has given to each grass its distinguishing vernacular name.

In most cases the distinguishing characters of the inflorescence are very slight. I find the size of spikelets and degree of hairiness very variable, within certain limits, in each species and one must depend on a correlation of characters rather than on any specially outstanding character in determining the species.

A detailed account of all the *Digitarias* at Prinshof with their agricultural and grazing value will appear in another publication.

The letters N.H.P. before a number signify National Herbarium, Pretoria.

D. Pentzii.

Perennial, densely tufted, much branched from the crown with intravaginal innovation shoots, sending out numerous surface runners or stolons bearing dense fascicles of short upright or spreading shoots from the rooting nodes, internodes glabrous or hirsute, often reddish. *Flowering culms* erect or sub-geniculate 3 -7 noded, the lower internodes short and usually included, the uppermost long exserted and equalling half or more the length of the culm which reaches a height of about 120 cm.; *leaf sheaths* rather loose, the upper glabrescent, the lower hairy with rather long fine hairs, densely and appressedly silky hairy at the base, compressed, up to 14 cm. long; *ligule* membranous, broadly rounded to truncate, often denticulate, up to 5 mm. long; *blades* linear from a slightly narrowed base tapering to a long very narrow apex, up to about 30 cm. long by 6mm. broad, minutely and softly hairy above and below or quite glabrous or with a few scattered long white hairs, scaberulous on both sides but more so on the under side, midrib raised in a prominent keel below, grooved above, primary nerves about 5 on either side, not prominent. The leaves of the stolon shoots are usually shorter and broader. *Racemes* about 3–12 and about 17 cm. long, strictly umbelled or sub-digitate on an elongated axis up to 3 cm. long terminating in 1, 2 or 3 racemes; *rhachis* triquetrous, narrowly winged, ·5 mm. wide, scabrid on

the margins and on the facial angle, glabrous ; *pedicels* 2-nate, rarely 3-nate, triquetrous, scabrid, the longer about 2 mm. long, lower about ·5 mm., glabrous ; *spikelets* imbricating, 3–3·5 mm. long and up to 1 mm. wide, narrow lanceolate acute ; *lower glume* reduced to an ovate rounded or truncate nerveless scale ; *upper glume* equalling about $\frac{2}{3}$ the length of the spikelet, 3-nerved with dense lines of rather long straight fine blunt hairs between the nerves and on the margins, the marginal extending beyond the tip ; *lower valve* the size of the spikelet, 7-nerved, nerves smooth, the inner lateral nerves rather close with dense lines of soft fine blunt hairs between them and on the margins, hairs often ultimately spreading and up to 1 mm. long ; *pale* and *lodicules* up to ·3 mm. long ; *fertile floret* slightly shorter than the lower valve, narrow lanceolate acuminate, thinly chartaceous.

Transvaal : Zoutpansberg ; Mara, Kligoblin, *Archer* 18 ; Downs *Junod* 4086 ; Elim Mill, *Thomas* 9, 4 and 3 ; Manner Mead, *Daire N.H.P.* 8376 ; Messina, *Turner* 25, 17 ; *Pole Evans N.H.P.* 8496 ; Pietersburg *McKechnie, N.H.P.* 7913 ; Pretoria District : Pretoria *Pentz N.H.P.* 8044, 8051, 8560, 8550, 8554, 8521, 8051 ; Kaalfontein, Wilfontein Farm, *Bevan, N.H.P.* 7602 ; Hamanskraal *Tregenna* 201, *Pearce, N.H.P.* 7958 ; Vastfontein, *Liebenberg N.H.P.* 7955 ; Rustenburg District : Verdun, *Cellier, N.H.P.* 7910 ; Marico District : Malmanie Oog, Ottoshoop, *Liebenberg, N.H.P.* 7966 ; Wolmaransstad ; Boskuil, *Sutton* 108 ; Standerton District : Balfour, *Visser, N.H.P.* 8020.

Orange Free State : Parys, *Ramsbottom, N.H.P.* 8380.

Cape Province : Vryburg District : Vryburg *Pentz, N.H.P.* 8501, 8509, 8510 (type) ; Iffley, *Mather, N.H.P.* 7947 ; Bechuanaland : Vukwe, *Pole Evans and Pentz, N.H.P.* 8493 ; Tati District : Francis Town, *Pentz, N.H.P.* 8521.

var. minor (=*Digitaria eriantha* var. *stolonifera*, Stapf.) rather weaker and more straggling than the type, Racemes 4 or 5 rarely more numerous, usually strictly umbelled, spikelets about 2·5 mm. rather plumper and less acuminate than the type, hairs of the valve often mixed with fine but stiff bristles.

Transvaal : Waterberg : Middelfontein Num-num, *Donisthorpe, N.H.P.* 7864 ; Naboomspruit : Koornpunt, Kalpan, *Langerman, N.H.P.* 8702 ; Palala, *Espach, N.H.P.* 7622 ; Pietpotgietersrust, *Pentz, N.H.P.* 7816, 8513 ; Pyramid Estate, *Galpin* 8874 ; Hangklip, *Knothe N.H.P.* 7960 ; Marico District : Malmanie oog, Ottoshoop *Liebenberg, N.H.P.* 7965 ; Pretoria District : Hamanskraal *Pentz, N.H.P.* 8514 ; Pretoria, Paardefontein, *Liebenberg N.H.P.* 8024 ; *Steyn N.H.P.* 8054.

This species varies considerably within its prescribed limits many of the variations being probably due to hybridisation. This is the well-known " Woolly Finger Grass " of South Africa that has been proved to be such an excellent pasture grass. Specimens of this grass and of other stoloniferous species have been distributed under the name of *D. eriantha* var. *stolonifera* Stapf. but only the one fairly constant variety, *D. Pentzii* var. *minor*, really corresponds to the type of Stapf's variety.

D. valida.

Densely tufted perennial with intravaginal innovation shoots and sending out long rather stout and often repeatedly branched runners, that root and shoot from the nodes, internodes and young shoots hairy. *Culms* glabrous, smooth, subterete, geniculate from about the second node and then erect, stout, up to 130 cm. high, 3–4 noded, simple or more usually branched from one or more of the lower nodes, uppermost internode very long ; *sheaths* of leaves up to 18 cm. long compressed and keeled, the lower loosely hairy all over, densely silky tomentose at the base, the upper glabrescent except at the always hairy nodes, firm, rather loose ; *ligule* delicately membranous, up to 5 mm. long, ovate obtuse, glabrous, minutely denticulate ; *blades* linear lanceolate from a slightly narrowed base, long tapering to a narrow acute apex, 18–50 cm. long by 5–9 mm. wide, firm, flat or lightly folded, glabrous, smooth below, with scabrid margins, midrib grooved above and forming a prominent firm keel below, primary nerves 3–4 on either side the midrib. *Racemes* about 9–14, whorled

or sub-whorled on a short (about 3·5 cm. long), common angled axis, up to 13 cm. long ; *pedicels* 2-nate the longer rather less than 1–1·5 mm. long, scabrid, glabrous. *Spikelets* narrow ovate-lanceolate, acute, about 3–5 mm. long ·7 mm. wide, *lower glume* a rather firm minute, membranous scale ; *upper glume* about two-thirds the length of the spikelet, 3-nerved with lines of fine blunt appressed hairs between the nerves and on the margins ; *lower valve* the size of the spikelet, 7-nerved, nerves smooth, rather close, hairs as in the upper glume ; *pale* ·7–1 mm. long, lodicules minute, truncate ; *fertile floret* rather firmly membranous, lanceolate acuminate, slightly shorter than the lower valve.

Transvaal.—Pretoria, *Pentz, N.H.P.* 1970 (*type*) 8506, 8552, *Wager, N.H.P.* 8060 ; Rustenburg, Doornpoort, *Mogg, N.H.P.* 8571 and 8572 ; Marico, Skuinsdrift, *Liebenberg* 564 ; Slurry, *Pole Evans and Pentz, N.H.P.* 8520 ; Malmanie's Oog, *Pentz, N.H.P.* 8512 ; Heidelberg, Uitgevallen, *Burtt-Davy* 13666 ; Carolina, Coed-Byclair Farm, *Howel-Jones, N.H.P.* 8322 ; Lydenberg, *Pentz, N.H.P.* 8515 ; Potchefstroom, *Liebenberg, N.H.P.* 8630 ; Vereeniging, Farm Zuurfontein, *Pentz, N.H.P.* 8497.

Orange Ffee State.—Parys, *Ramsbottom, N.H.P.* 8377 ; Heilbron, Maccauvlei, *Brandmuller* 54.

Cape Province.—Mafeking, Pitsani, *Pole Evans and Pentz, N.H.P.* 8548. Bechuanaland : Padden on Molopo River, *Pole Evans* and *Pentz, N.H.P.* 8558.

Var. **glauca.**

Culms and stolons more slender, leaves shorter, glaucous, internodes of runners glabrous.

Transvaal.—Pretoria : Hamanskraal, *Pentz, N.H.P.* 8499 ; Pretoria : Groenkloof Valley, *Mogg, N.H.P.* 7969 ; Klapperkop, *Stent* and *Mogg, N.H.P.* 7968.

A very useful grazing grass of the " Woolly Finger " type (*D.Pentzii*) but much taller and coarser with broader leaves, stouter runners.

D. Polevansii.

Stoloniferous perennial from a thickened much branched rhizome bearing numerous bulbous extravaginal innovation shoots covered with short silky tomentose cataphyls. The long, stout surface runners or stolons root firmly at the nodes and send up fascicles of bulbous based shoots, internodes purplish grey and up to 20 cm. or longer. *Culms* erect rather bare from a bulboid base, up to about 1·3 m. high, smooth, glabrous, 4–5 noded, branched from the lower or middle nodes, internodes mostly included except the uppermost which is long exserted ; *leaf sheaths* long, rather loose, finely ribbed, smooth, glabrous or the lower sometimes finely hirsute or ciliate and early falling away leaving a rather bare culm base ; *ligule* membranous, mostly truncate or rounded, denticulate, up to 3 mm. long and usually more or less appressed to the blade ; *blades* glaucous, linear lanceolate, slightly narrowed at the rounded base, tapering to a fine point, flat, up to 40 cm. long by 8–11 mm. broad, quite smooth, glabrous or minutely hirsute with a few tubercle based hairs at the base, margins cartilagenous smooth, primary lateral nerves about 5 not very conspicuous on either side the slender prominent midrib. *Racemes* up to 12 and about 9–16 cm. long strictly digitate or with an additional 1–4 terminating the shortly elongated angled axis, *rhachis* triangular with narrow winged, smooth or sparsely scabrid margins, ·5–·75 mm. wide, glabrous ; *pedicels* 2-nate, scabrid with cupular sub-membranous tips, the longer up to 2 mm. *Spikelets* appressed, sub-imbricating about 3 mm. long excluding the hairs at tip, narrow-oval-acute, greyish green to leaden or brownish when mature ; *lower glume* very small but distinct, thinly membranous, obtuse to sub-acute ; *upper glume* narrow, 3-nerved, acute, equalling about three-quarters to rather less of the fertile floret, with long silky hairs between the nerves and on the margins and tip ; *lower valve* usually purplish, ovate acute, the size of the spikelet, 7-nerved, midnerve prominent, lateral faint, smooth, lines of the silky obtuse usually appressed hairs between the inner lateral nerves and on the margins ; *fertile floret* eliptic, rather shorter than the lower valve, pale greyish green to light golden brown, flaps broad meeting or in some cases overlapping.

Cape Province.—Bechuanaland, Vryburg, N.W. of Armadillo Creek, *Burtt-Davy* 13871 ; Kuruman, *Pole Evans* 2065, 3322, Molopo River, *Pole Evans* and *Pentz*, *N.H.P.* 8561 ; Mafeking between Vuilnek and Inkruip, *Pole Evans* 2418, 2419.

A very distinctive species with bulbous-like bases to the culms. The stout runners reach a length of 450–600 cm.

D. decumbens.

Perennial. Culms fascicled on a short rhizome, innovation shoots intravaginal, stoloniferous. Flowering culms up to 113 cm. rather bare at the base, many noded, usually decumbent, much and often repeatedly branched and often rooting at the lower nodes, glabrous, smooth, terete or slightly compressed ; *sheaths* rather long and loose, smooth, glabrescent, those of the young shoots often finely hirsute especially at the nodes ; *ligule* thinly membranous, truncate, about 3 mm. long ; *blades* linear lanceolate from a slightly narrowed base tapering to an acutely acuminate tip, flaccid, minutely scaberulous, glabrous, up to 14 cm. long (those of barren shoots sometimes to 28 cm.) by 7 mm. broad, light green. *Racemes* up to 13 cm. long, typically widely spreading the lower almost horizontal, 6–10 arranged in a single whorl (usually of 6) at the apex of the culm or with the common axis elongated about 1–1·5 cm. and bearing a second whorl of 2–4 at the tip, occasionally with one or two scattered below the top whorl. *Rhachis* sub-flexuous, slender, flat on the back trigonous on the face with narrow but distinct green winged margins, scabrid, glabrous, from ·4–·8 mm. wide ; *pedicels* 2-nate, slender trigonous, scabrid, longer up to 1·5 mm. long ; *spikelets* rather loosely imbricating, narrow lanceolate-acuminate, 2·7–3 mm. long by ·6–·8 mm. wide, scantily and usually appressedly hairy ; *lower glume* a minute obtuse membranous persistent scale, *upper glume* narrow oblong equalling half to three-quarters length of the spikelet, 3-nerved, nerves smooth lines of fine closely appressed silky hairs between the nerves and slightly longer (up ·5 mm.) and spreading hairs on the margins ; *lower valve* the size of the spikelet, 7-nerved, rather close and prominent and smooth, apparently glabrous, but actually with narrow lines of closely appressed silky hairs in the lower half between inner pairs of lateral nerves and on the margins right to the tip of valve, hairs never longer than ·5 mm. and not or seldom spreading, *fertile floret* narrow lanceolate acuminate, slightly shorter than the lower valve, greyish yellow to purplish.

Transvaal.—Barberton District : Nelspruit, *Pentz*, *N.H.P.* 8495.

The loosely fascicled culms the weak mostly desumbent and leafy stems, the widely spreading racemes and the apparently glabrous or sparsely and shortly hairy spikelets, distinguish it from *D. Pentzii*.

D. Swazilandensis.

Perennial more or less prostrate creeping grass sending out long slender rooting runners with numerous short glabrous or sparsely hairy internodes. Culms prostrate erect, very slender, glabrous smooth, terete, with many short, more or less included, internodes below the comparatively long (up to 13 cm.) uppermost internode ; frequently branched and sending out leafy barren shoots. *Sheaths* somewhat compressed at length slipping from culm, glabrous except at the long hairy nodes or sparsely long and softly hairy, produced in an auricle on one or both sides of the mouth. *Ligule* rounded or truncate, thinly membranous about ·7 mm. long ; *blades* flat narrow ovate-lanceolate from a rounded and contracted base, tapering to a narrow acute apex, up to 7 cm. long by 4 mm. wide, glabrous or with a few scattered fine hairs towards the base, smooth except at the tip and on the minutely scaberulous margins. *Racemes* 2–3 very rarely 4, slender, about 5–7 cm. long, *rhachis*, about ·4 mm. wide, narrowly winged, triquetrous and sharply angled on the face, glabrous and smooth except on the minutely scaberulous margins ; *pedicels* 2-nate, terete or somewhat flattened or sub-triquetrous, longest about 1·5 mm. long, minutely scabrid on the margins ; *spikelets* somewhat imbricating, 2–2·5 mm. long, about ·7 mm. wide, oval-acute, apparently glabrous. *Lower*

glume an obtuse to truncate, persistent, membranous scale ; *upper* oval acute, rather broad and thin, equalling half to two-thirds the length of spikelet, 3-nerved with scanty lines of appressed straight fine hairs between the nerves and on the margin those towards the tip longer and slightly denser ; *lower valve* thinly membranous the size of the spikelet, rather prominently, 7-nerved with scanty lines of appressed hairs between the inner pair of lateral nerves and on the margins, fertile floret oval, acute, purple.

Near to *D. horizontalis* but a perennial with shorter narrower and less scabrid leaves, and fewer racemes.

Swaziland.—Stegi *Mrs. Perkins N.H.P.* 7931 ; on the border near Mrs. Andrews' farm, *Pentz N.H.P.* 8557.

A prostrate grass that makes a mass of short dense matted foliage suitable for a lawn, or for short crop for sheep, does well with clover.

D. rigida.

Perennial, caespitose, sending out long branched and rather rigid runners that root and shoot from the nodes. *Culms* geniculate or prostrate erect about 75 cm. long, 4–6 noded, simple or branched, glabrous, smooth, sub-terete, compressable ; *sheaths of the leaves* firm, loose finely and closely striate, smooth, glabrous except at the densely silky nodes, or with a few scattered hairs ; *ligule* prominently exserted, membranous 5–14 mm. long, dentate, adnate to the often rather long auricles of the sheath ; *blades* linear, flat or folded, 5–20 cm. long by about 3–4 mm. wide, from an equally wide base long tapering to an acute apex, very firm, smooth glabrous or softly and sparsely hairy on the upper side, midrib rather stout and prominent below, whitish above, primary lateral nerves about 6 on either side, close and firm. *Racemes* 6–9 in whorls or sub-whorls on a short common axis, about 7–9 cm. long ; *rhachis* narrow, about ·5 mm. wide margined or very narrowly winged, scabrid, glabrous ; *pedicels* 2-nate or sometimes 3-nate towards the base, longest about 2 mm., scabrid ; *spikelets* imbricating, about 3 mm. long, ovate lanceolate, acute, *lower glume* a nerveless membranous scale ; *upper glume* equalling from half to two-thirds of the spikelet, 3 nerved with very dense lines of fine, straight, blunt hairs between the nerves and on the margins ; *lower valve* equalling the spikelet, 7-nerved, the inner pairs of lateral nerves rather remote from the central nerve and equally prominent, all smooth and with lines of rather fine, stiff, straight, blunt hairs between the inner lateral nerves and on the margins, the hairs between the nerves rather scantily appressed, those on the margins longer and rather denser. *Fertile floret* elliptic, lanceolate, shortly and acutely acuminate, firmly membranous, finely punctate striate, light green or purplish, margin rather distant ; *anthers* about 1·5 mm. purple.

Transvaal.—Magalakwin, *Pole Evans, N.H.P.* 8530.

The very hard leaves and the long prominent ligule distinguish this species from other stoloniferous species of the same type. Roots of the grass were collected by Dr. Pole Evans in the Northern Transvaal and planted at Prinshof. This description is from a single flowering specimen collected from those roots.

D. glauca.

Perennial, densely tufted, with intravaginal innovation shoots on a short oblique or descending rhizome. Culms glabrous, terete, erect or sub-geniculate, rather stout, up to 135 cm. high, much or scantily branched from the lower nodes, 2–5 noded, lower internodes included, upper exserted, uppermost longer than half the culm ; *lower sheaths* compressed, from 5–12 cm. long, loose, finely ribbed, more or less densely hairy at the base, otherwise glabrous or with scattered rather long tubercle based hairs but never densely hairy ; *ligule* delicately membranous, oblong obtuse, 3–5 mm. long, 3-lobed or toothed, sides adnate with the sheath auricles, glabrous ; *blades* rather firm mostly strongly folded, finely ribbed, about 3 mm. wide to 30 cm. long, culm leaves shorter, finely scaberulous on the nerves on

either surface, glabrous, glaucous. *Racemes* about 4–7, sessile, obliquely ascending, about 10–14 cm. long, the lowest usually 2-nate or 3-nate, the succeeding variously arranged on a short angular scaberulous glabrous axis 3–5 cm. long, the terminal raceme solitary and erect, rhachis of racemes, triquetrous, very narrowly winged, ·3–·5 mm. wide, scabrid, finely pubescent at the junction with the main axis otherwise glabrous ; *pedicels* angled, slender, scabrid, with shallowly concave membranous tips, 2-nate or often on short contracted branchlets at the base of raceme ; *spikelets* loosely appressed or spreading, not imbricating, often their own length apart, narrow lanceolate-acuminate, 4–4·3 mm. long by 1 mm. wide, conspicuously but not very long, hairy ; *lower glume* an ovate, nerveless, rather firmly membrous scale usually about ·5 mm. long ; *upper glume* equalling about half to three-quarters the length of the spikelet, narrow ovate-obtuse, 3-nerved with lines of soft fine obtuse hairs between the nerves and on the margins, produced beyond the tip of the glume ; *lower valve* the size of the spikelet, 7-nerved, nerves smooth, rather close and equidistant, with lines of straight soft appressed or somewhat spreading hairs between the inner lateral nerves and on the margins, hairs up to 1.5 mm. long ; pale and lodicules, hyaline, minute ; *fertile floret* narrow oval acuminate equalling or slightly shorter than the lower valve, pallid sometimes faintly flushed with purple, the flaps of valve closely approximating.

Transvaal.—Pretoria : near Government House, *Pentz*, *N.H.P.* 8519, Pretoria, *Pentz*, *N.H.P.* 8670, Heidelberg, Henley-on-Klip, *Stent*, *N.H.P.* H. 21592.

Orange Free State.—Kroonstad, *Hall*, *N.H.P.* 8669 ; Fauresmith, Botanical Reserve, *C. A. Smith* 4098, 3960 ; *Breda* 16.

Cape Province.—Gordonia, Inkruip, *Pole Evans* and *Pentz*, *N.H.P.* 8555.

A tufted species very glaucous with foliage seldom above 30 cm. high and numerous tall erect flowering stems, very near to *eriantha* but differing from that species in its longer more rigid leaves, taller stouter culms, longer laxer racemes, more densely and long hairy spikelets, etc.

Var. **Bechuanica.**

Sheaths longer, densely hirsute, culms stouter, racemes more numerous and spikelets imbricating and more crowded.

Cape Province.—Mafeking : Langeberg Camp, *Pole Evans* 2421 ; Olifantshoek, *Pole Evans* and *Pentz*, *N.H.P.* 8556 ; Upington, on quartzite kopje, *Pole Evans* 2194.

D. natalensis.

Densely tufted perennial. *Culms* rather stout, up to about 120 cm. high, erect and very straight or more or less geniculate, simple or branched, glabrous, smooth or often scaberulous just below the panicle, 4–6 noded, lower internodes usually included, upper exserted, uppermost very long. *Sheaths* of the lower leaves firm sub-compressed, loose, up to about 25 cm., glabrous except at the usually hirsute base or more or less densely beset with rather rigid sharp pointed hairs especially on the margins, those of cauline leaves usually quite glabrous or more or less finely pubescent at base ; *ligule* rather firmly scarious, up to 15 mm. long, rounded or truncate, sometimes scantily but rather long ciliate, often with the margins produced and adnate to the auricles of the sheath mouth ; *blades* linear, up to 60 cm. long by 8 mm. wide (fresh material) flat or folded, tapering to an acute apex, smooth, or the upper surface minutely scaberulous, midrib rather broad and stout, lateral nerves prominent and close, blades of the upper culm leaves sometimes much reduced. *Racemes* many, digitate or sub-digitate on a short (up to 5 cm. long) common axis, 12–23 cm. long ; rhachis about ·5–·8 mm. wide, triquetrous, narrowly winged, straight or flexuous, scabrid on the margins and the facial angle, glabrous except at the minutely pubescent base ; *pedicels* 2-nate or 3-nate or sometimes in fascicles of 4–5, scabrid with truncate tips ; *spikelets* not or laxly sub-imbricating ovate lanceolate acute, about 3 mm. long ; *lower glume* minute but distinct, membranous ; *upper glume* narrow, obtuse, 3-nerved,

equalling about half the spikelet, lines of fine silky obtuse hairs between the nerves and on the margins ; *lower valve* the size of the spikelet, 7-nerved, minutely scaberulous on the nerves and often on the spaces between, hairs between the inner lateral nerves and on the margin not very long, straight, acute, usually closely appressed or somewhat spreading with age and often mixed with rather rigid acute bristle-like hairs ; *fertile valve* greenish grey, as long as or slightly shorter than the lower valve, rather firmly membranous, shortly apiculate, margins rather distant.

Natal.—Umkomaas, *van Rensburg*, *N.H.P.* 8630 (type) ; Maritzburg, *McClean* 184 ; Zululand-Mtunzini *Mogg*, *N.H.P.* H.20026, H.20042 ; Ixopo, Glen Daun, *Bruce*, *N.H.P.* 8072 ; Matubatuba, *Harrison*, *N.H.P.* 8323 ; without precise locality *Storey* 21 ; Kentani, in valleys *Pegler* 1092.

Near to *D. Smutsii* Stent but very different in the field with more rigid leaves and longer ligule ; the hairs of the spikelet are rather stiff and the nerves of the lower valve minutely scaberulous.

D. littoralis.

Densely tufted perennial on short stout descending rhizome. *Culms* erect or geniculate, rather stout, glabrous, smooth, 3–4-noded usually branched and often sending out fascicles of shoots from the lower nodes, up to 120 cm. high, lower internodes included, upper exserted ; leaves very green, crowded and more or less flabellate at the base ; *sheaths* loose, rather long, the lower shortly and appressed hairy at the base otherwise glabrous or with few scattered hairs, compressed, finely and closely striate ; *ligule* up to 9 mm. but usually much shorter, minutely fimbriate ; *blades* flat, linear, from a scarcely narrowed base tapering to long acuminate points, glabrous tip scaberulous, about 30 cm. long by 7 mm. broad, midrib prominent below, primary lateral nerves about 4 on either side, not conspicuous. *Racemes* 7–10, obliquely spreading, 10–16 cm. long, more or less whorled or scattered on a short common axis 2–3 cm. (very rarely more) long, rather dense or sometimes interupted, *rhachis* of racemes narrow, triquetrous, margined, ·5 mm. wide, scabrid, glabrous ; *pedicels* 2-nate, longer about 1·3 mm., scabrid, angled, with membranous discoid tips. *Spikelets* sub-imbricating, somewhat crowded, lanceolate, oblong, 3·5–4 mm. long and 1 or slightly over 1 mm. broad, conspicuously hairy, hairs fine obtuse, under 1 mm. long ; *lower glume* a well developed firmly membranous nerveless ovate-lanceolate obtuse to sub-acute scale, 1–1·5 mm. long ; *upper* equalling about three-quarters the length of the spikelet, 3-nerved with hairs on margins and between the nerves ; *lower valve* the size of the spikelet, 7-nerved, nerves often minutely scaberulous, equidistant or the inner lateral pair somewhat remote from the central nerve, hairs between nerves and on the margins appressed, ultimately spreading ; *fertile floret* as long as the lower valve, anthers 2·3 mm. long.

Cape Province.—Albany Division : Grahamstown, Schonland 3739 (type), Howiesons Poort, *Worracher*, *N.H.P.* 8671, *Dyer*, *N.H.P.* 8502 ; Port Elizabeth, *Gunn*, *N.H.P.* 7866 , *Galpin* 6384 ; Port St. Johns, Eagle's Nest, *Howlett* 36.

Near to *D. natalensis* which is however a coarser grass with very firm leaves, more numerous racemes and coarser almost bristle-like hairs on the spikelet.

A densely tufted very green species, flowering culms, 126 cm. high and foliage about 50 cm. high. More resistant to frost than other species under cultivation.

Var. **prostrata.**

Densely tufted giving off numerous runners that root (rather lightly ?) at the nodes and always terminate in a flowering culm—they are in fact prostrate culms—fascicles of flowering shoots are given forth from most of the nodes. A very blue variety.

Cape Province.—Albany: Grahamstown, *Pentz*, *N.H.P.* 8021 and 8504; Port Elizabeth, *Gunn*, *N.H.P.* 8517, 7973, 8494.

Gunn 8494 is a rather smaller form with more slender flowering culms and very long runners which do not always terminate in flowering culms.

D. geniculata.

Perennial on a stout descending rhizome. *Culms* fascicled, prostrate erect up to 90 cm. high, much branched from the base and from the lower nodes, nodes usually many, the basal internodes short and included; *leaf sheaths* glabrous or hairy at the base and along the margins, smooth, rather loose, finely ribbed; *ligule* delicately membranous, glabrous, up to 7 mm. long but often appearing shorter from the tearing away or folding over of the delicate obtuse tip; *blades* linear from a slightly narrowed base tapering to an acuminate setaceous tip about 30 cm. long by 4 mm. wide, quite glabrous or sparsely hairy with scattered long white hairs, scaberulous on the upper surface and margins, midrib, slender, somewhat prominent below, indistinct above, finely ribbed, primary lateral nerves scarcely distinguishable; *racemes* 4–9 digitate or sub-digatate on a short axis, about 9–12 cm. long, obliquely erect or rather widely (but not horizontally) spreading; *rhachis* narrow triquetrous, margined, scaberulous, pedicels triquetrous, 2-nate, scaberulous; *spikelets* narrow, ovate, lanceolate, acute or sub-acute 3·4 mm. long, rather lax, not imbricating; *lower glume* up to ·5 mm. long, membranous, nerveless; *upper* 3-nerved equalling half to three-quarters the length of the spikelet with rather dense lines of soft spreading hairs between the nerves and on the margins; *lower valve* the size of the spikelet 7-nerved nerves, smooth, equidistant, with lines of soft hairs between the inner lateral nerves and on the margins, hairs about ·5 mm. long, margins hyaline; *fertile floret* equalling or slightly shorter than the lower valve, lanceolate, yellowish to brown; anthers yellow, about 2 mm. long.

Cape Province.—Wodehouse: Dordrecht *Pentz*, *N.H.P.* 8049 (type), 8498; Oudtshoorn, De Rust *Pentz*, *N.H.P.* 8518; Willowmore, near Pienaars River, *Pole Evans* and *Pentz* *N.H.P.* 8508.

Orange Free State.—Senekal, Cyferfontein, *Joubert*, *N.H.P.* 7952.

D. foliosa.

Perennial on a shortly creeping rootstock with extravaginal innovation shoots covered with lanceolate-ovate membranous, closely ribbed hairy cataphyls. *Culms* slender up to 45 cm. high, shortly exceeding the leaves, 5–6 noded, branched from most of the nodes or only from the upper, internodes (except the uppermost) short included, leafy throughout but more so towards the top. *Sheaths* of the leaves thin, loose, the lower soon withering, glabrous except for occasionally a few tubercle based hairs towards the mouth; *ligule* thinly scarious, irregularly toothed, about 1·5 mm. 3-lobed the central lobe broadly rounded, the side lobes short or narrowly elongated and adnate to the sheath-auricles; *blades* rather dark green, linear lanceolate, flat, acutely long acuminate, 6–13 cm. long by 3–5 mm. wide, rather firm, with narrow cartilaginous margin, smooth, glabrous or with a few scattered tubercle based hairs mostly towards the base, midrib slender, prominent below, grooved above. *Racemes* slender, 2–7, digitate or sub-digitate, on a very shortly elongated axis, 4–6 cm. long; *rhachis* slender, flat on the back, trigonous on the face, narrowly winged, about ·5 mm. wide; *pedicels* scaberulous, 2-nate, angled or the shorter terete, sometimes on short appressed branchlets. *Spikelets* lanceolate acute, about 2–5 mm. long; *lower glume* a small membranous scale; *upper glume* ovate acute or sub-acute, equalling about three-quarters the length of the spikelet and about as broad at the base, 3-nerved, the hairs between the nerves and on the margins very fine blunt and under 1 mm. long; *lower valve* the size of the spikelet, thin, 7-nerved, three middle nerves, slender but rather prominent, others somewhat obscure, hairs between the inner lateral pairs short and appressed, the marginal longer but also usually appressed; *fertile floret* narrow ovate acute, slightly shorter than the lower valve, margins approximating; anthers and stigmas purple.

Cape Province.—Kuruman, Vuilnek, *Pentz, N.H.P.* 8527.

A distinct species presenting, when growing, a bushy effect with the flat rather firm leaves gathered towards the tops of the culms leaving the bases covered only with the withering sheaths. The comparatively short flowering culms and racemes are also rather distinct.

D. trichopodia.

Upright perennial, innovations intravaginal (?). *Culms* about 45 cm. high, 2–3 noded, simple, rather stout, densely and rather softly hairy in the upper part below the panicle. *Sheaths* of the cauline leaves rather tight exceeding to very little shorter than the internodes, glabrous except at the rather long and densely bearded nodes, smooth; *basal sheaths* brownish rather firm, loose, like the ovate acute cataphylls densely silky hairy at the base and more or less so further up; *ligule* rounded or truncate, membranous, glabrous, rather short or up to 3 mm. long, rather firm; *blades* broad, flat, up to about 19 cm. long by 10 mm. wide, smooth, or scaberulous in the upper surface, glabrous except for a few scattered long hairs on either side the ligule, midrib slender not prominent, primary lateral nerves 5–6 on either side. *Racemes* compound towards the base 5–10, solitary on an elongated common axis forming a more or less contracted panicle, axis up to 12 cm. long, angled and ribbed and covered with long cream, silky rather thick walled acutely acuminate hairs, branches short and appressed; *rhachis* trigonous, flexuous, margined, about ·5 mm. wide, densely hirsute along the margins and on the face with the same long shining rather rigid hairs; *pedicels* 2-nate or solitary or more often in fascicles of 3–6, densely long, hairy, the hairs at the discoid tips exceeding to spikelets. *Spikelets* crowded almost hidden by the copious hairs of the rhachis and pedicels, quite glabrous and smooth; light golden brown paling to yellow at the tips, ovate acute, rather plump about 2 mm. long; *lower glume* 0, upper reduced to a thinly membranous emarginate nerveless or faintly 1–3 nerved scale about ·5 mm. long; *lower valve* the size of the spikelet, thinly membranous 3–5-nerved, the outer nerves when present some distance from the margins, very faint and evanescing above, the two inner lateral nerves anastomosing with the centre nerve just below the tip, *pale and lodicules* wanting; *fertile valve* golden brown rather tough the hyaline flaps sometimes overlapping at the tip or distant to the base; *pale* resembling the valve but more deeply coloured on the back and with the flaps narrow towards the tip and overlapping at the base; *anthers* about 1·5 mm. long, brownish.

Cape Province.—Komgha Division, grassy slopes near Kei Mouth, *Flanagan* 987.

The only specimen I have seen of this grass which was collected by Flanagan in 1892, there are no barren shoots and the tips of all the leaves are broken off.

Very near to *D. uniglumis* but with broader leaves, longer and more copious setae on the axis and pedicels and larger spikelets and more compound racemes, etc. Also very near to *D. Grantii* Hubbard from which it differs in the densely bearded sheath-nodes, wider leaves, longer and more densely silky racemes, etc.

D. apiculata.

Perennial, rather loosely fascicled with intravaginal and extravaginal innovation shoots the latter covered at the base by linear lanceolate, strongly striate cataphylls. *Culms* geniculate, slender, simple, 2–3 noded with lowest internode very short, smooth, glabrous or softly pubescent for a short distance below the panicle; *leaf sheaths* narrow, rather loose, striate finely hirsute, those of the slender barren shoots about 3–5 cm. long; *ligule* not exserted, firmly membranous and brownish, up to 1 mm. long, sheath margins not produced; *blades* narrow linear from 1·3 mm. to 3 mm. wide and up to 17 cm. long, not or slightly narrowed at the base, long tapering to a fine point, rather rigid hairy on both surfaces, margins revolute, midrib slender but prominent with 3–5 primary lateral nerves scarcely differentiated from the secondary, all rather prominent and the leaf therefore having a ribbed

effect. *Racemes* 4–7 and up to 8 cm. long solitary common axis very short, slender, angular, ribbed, minutely pubescent and scabrid, rhachis about ·5 mm. wide, triquetrous with narrow scabrid margins and occasional fine hairs below the pedicels; internodes 2·5–5 mm. long; *pedicels* binate or ternate or in fascicles of 3–5, very uneven in length the longest commonly up to 3 or 4 mm. long, slender, scabrid with small discoid tips. *Spikelets*, rather loosely spreading, about 2 mm. long, ovate acute, rather plump and quite glabrous; *lower glume* minute broadly clasping, thinly membranous to hyaline, truncate nerveless; *upper glume* ovate obtuse equalling less than half the spikelet, thinly membranous prominently 3-nerved; *lower valve* equalling or almost, the spikelet in length, very thin rather narrow ovate acute, prominently 5-nerved, nerves smooth, equidistant; pale and lodicules minute; *fertile valve* determining the size of the spikelet, elliptic oblong, minutely apiculate, coriaceous, light yellowish brown when young soon deepening to dark brown except at the base and the small apiculus which remain yellow; *pale* of the same texture and colour as the valve; lodicules broadly cuneate about ·5 mm. long; *anthers* little over 1 mm. ovary narrow ovate, stigmas long plumose at the tips of the styles, grain not seen.

Swaziland.—*Burtt-Davy* 2820 (type); Transvaal: Barberton, Devils Kantoor, Kaapsche Hoop, *Pole Evans* 1013.

Nearest to *D. Ibura* but a perennial with slenderer, fewer and not compound racemes narrower leaf blades, etc. The small yellow apiculus of the dark valve was very noticeable.